Volume 091
Article 01

IDAHO
DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

FEDERAL AID IN FISH RESTORATION
Job Performance Report
Project F-71-R-16

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

Job No. 6-a.	**Region 6 Mountain Lakes Investigations**
Job No. 6-b.	**Region 6 Lakes and Reservoirs Investigations**
Job No. 6-c.	**Region 6 Rivers and Streams Investigations**
Job No. 6-d.	**Region 6 Technical Guidance**

By

Mark Gamblin, Regional Fishery Biologist
Steve Elle, Regional Fishery Manager
Jim Tharp, Fisheries Technician

May 1993

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

CONTENTS

LIST OF TABLES (Cont.)

LIST OF FIGURES

CONTENTS

LIST OF FIGURES (Cont.)

LIST OF APPENDICES

Job No. 6-c. _ Region 6 Rivers and Streams Investigations

CONTENTS

TABLE OF CONTENTS (Cont.)

LIST OF TABLES

LIST OF TABLES (Cont.)

LIST OF FIGURES

CONTENTS

LIST OF FIGURES (Cont.)

CONTENTS

TABLE OF CONTENTS (Cont.)

Page

JOB PERFORMANCE REPORT

Name: Regional Fishery Management Investigations

State of: Idaho Project

Title: Region 6 Mountain Lakes Investigations

No: F-71-R-16

Job No: 6-a

Period Covered: July 1. 1991 to June 30. 1992

ABSTRACT

The Lost River drainages experienced continued drought conditions during 1991. The long-term affects of the drought have been drawdown of some high mountain lakes which rely on snow melt to annually refill. We utilized input from Challis National Forest, Mackay District to reevaluate the existing high lake stocking schedule. Input included subjective opinions on observed natural reproduction, overwinter survival, size of fish present in 1991, and angler use. Stocking was discontinued for 11 of the 49 lakes previously included on the three year rotation for supplemental fish releases.

Author:

Steve Elle
Regional Fishery Manager

OBJECTIVES

To maintain information for fishery management activities and decisions for mountain lakes.

METHODS

Work priorities for Region 6 fish management personnel did not allow for direct inventories of any mountain lakes in 1991. We did utilize input from Challis National Forest, Mackay District, to adjust stocking rates and dates of lakes included in three-year rotation stocking programs. Information provided included subjective information on natural spawning, overwinter survival, size of fish present in 1990 and 1991, and angler use. Where drought conditions have reduced water levels in various high lakes and no overwinter survival was observed, we discontinued stocking until further evaluations are made.

RESULTS

We discontinued stocking at 11 lakes in the Big Lost and Little Lost river drainages. Drought conditions since 1987 have reduced lake levels to the point no overwinter survival was observed in these lakes which were stocked in prior years. When normal annual moisture returns to the area, reevaluation for future stocking should be undertaken.

During 1991, we used the Challis National Forest fire standby helicopter to stock 13 high lakes in the Big Lost River Drainage (Table 1). During 1991 we initiated stocking of grayling Thymallus arcticus fry into Baptie and North Fork Bellas lakes. These lakes have outlet spawning habitat present and will potentially support future natural reproduction. Horseshoe Lake, Targhee National Forest, is stocked annually with grayling and received 2,000 fry in 1991.

The Challis National Forest has provided access to the fire standby helicopter in recent years for high lake stocking. In order to minimize flight time and stay within the two-hour per day fire standby contract, we adjusted stocking in some drainages. Mill Creek Lake was shifted from 1992 to 1993 to avoid an extra trip to Little Lost River Drainage. Iron Bog and Fish Pole lakes were moved from 1993 to 1992 rotation. Following 1992 stocking, Big Fall Creek Lake will be moved to the 1991 rotation. The three-year rotation is simply moved forward every three years for the next cycle.

R6DJ92

Table 1. Three year rotation schedule for mountain lake supplemental stocking, Region 6.

Catalog number	Lake	Year to stock	Species[a] stocked previously	Number
15-00-00-0132	Iron Bog #2	Discontinue		
15-00-00-0138	Horsethief	Discontinue		
15-00-00-0175	Bellas Canyon #1	1991	Ct	1,000
15-00-00-0176	N.F. Bellas	1991, 1993	Grayling	1,000
15-00-00-0189	Lake Creek #1	1991	Ct	500
15-00-00-0194	Clear Lake	Discontinue		
15-00-00-0196	Bench Lake	1991	Ct	500
15-00-00-0198	Betty	1991	Ct	2,500
15-00-00-0200	Baptie	1991, 1993	Grayling	500
15-00-00-0202	Goat	1991	Ct	1,000
15-00-00-0208	Kane Canyon	1991	Ct	1,000
15-00-00-0153	Grant Creek	1991	Rb	750
15-00-00-0156	Boulder	1991	Rb	2,000
15-00-00-0158	Washington	1991	Rb	500
15-00-00-0160	Arrowhead	1991	Rb	2,000
15-00-00-0163	Surprise Valley #1	Discontinue		
12-00-00-0114	Horseshoe Lake	Every Year	Grayling	2,000
15-00-00-0210	Ramey Creek	1991	Ct	500
15-00-00-0128	Brockie	1992	Ct	1,000
15-00-00-0183	Big	1992	Ct	3,000
15-00-00-0186	Rough Lake	1992	Ct	1,000
15-00-00-0187	Long	1992	Rb	1,500
15-00-00-0191	Round Lake	1992	Ct	1,000
15-00-00-0209	Big Fall Creek	1992[b]	Ct	500
15-00-00-0206	North Fork	Discontinue		
15-00-00-0124	Mill	1993	Ct	1,000
15-00-00-0203	Green	1992	Rb	1,500
16-00-00-0113	Aldous	1992	Ct	1,500
15-00-00-0104	Pass Creek	1992	Ct	1,000
16-00-00-0115	Hancock	1992	Ct	500
16-00-00-0117	Shadow Lake #1	Discontinue		
16-00-00-0118	Shadow Lake #2	1993	Rb	500
15-00-00-0119	Copper Lake	Discontinue		
15-00-00-0120	Upper Swauger	1993	Ct	2,000
15-00-00-0121	Lower Swauger	Discontinue		
15-00-00-0129	Iron Bog #1	1992	Rb	1,000
15-00-00-0130	Fish Pole	1992	Ct	2,000
15-00-00-0131	Bobber	Discontinue		
15-00-00-0181	Corral	1993	Ct	1,000
15-00-00-0122	Big Creek	1993	Rb	500
15-00-00-0116	Bear Creek	Discontinue		
16-00-00-0127	Divide Creek	1993	Ct	1,000
12-00-00-0102	Packsaddle	1993	Ct	2,000
15-00-00-0168	Angel	1993	Rb	1,000
15-00-00-0184	Golden	1993	Golden	1,000
15-00-00-0179	Bellas Canyon #2	Discontinue		
15-00-00-0162	Airplane	1993	Golden	1,000
16-00-00-0120	Salamander Lake	1993	Ct	1,000

[a]ct = cutthroat trout; Rb = rainbow trout
[b]Move to 1994 rotation

RECOMMENDATIONS

1. When normal precipitation resumes, reevaluate lakes for future stocking which were dropped from stocking program in 1991.

2. Stock Baptie and North Fork Bellas lakes with grayling in 1993 as well as the scheduled three year rotation in 1994. This will establish multiple year classes for future natural production.

R6DJ92

JOB PERFORMANCE REPORT

Name: Regional Fishery Management Investigations

State of: Idaho Project

Title: Region 6 Lakes and Reservoirs Investiaations

No: F-71-R-16 Job No.:

6-b

Period Covered: July 1. 1991 to June 30. 1992

ABSTRACT

Creel census was conducted at Ririe Reservoir from May 25 through August 25, 1992. Overall catch rate for fish kept was 0.4 fish/h, which is considerably lower than the 0.7 to 0.8 fish/h observed in prior census. Hatchery catchable trout Oncorhynchus mykiss were stocked at 150 to 180 mm, well below the requested 200 to 250 mm request, and probably contributed to reduced harvest. Jeff Dillon, Senior Fishery Research Biologist, completed smallmouth bass Micropterus dolomieu age growth analysis at Ririe Reservoir. Bass growth rates were average compared to 12 other reservoir populations monitored in 1991. The observed growth rates represent a newly-introduced expanding population. Ririe Reservoir is at 5,200 feet elevation with a short growing season and an abundant food supply. Annual gill net surveys at Ririe Reservoir indicated high numbers of chubs Gila R. and suckers Catostomus AR. with few cutthroat trout O. clarki. Yellow perch Perca flavescens, were captured for the second year.

Water temperature profiles were collected at Palisades Reservoir and Gem State Hydro Project to assess future smallmouth bass potential introduction at Palisades Reservoir and reproductive potential at Gem State pool. Palisades profiles are similar to Ririe Reservoir indicating potential for future introductions. Gem Lake temperature profiles indicate temperature may be limiting to future reproductive success by smallmouth bass.

During 1990, we made initial introductions of smallmouth bass to the Snake River at Idaho Falls. In 1991, we made the second and final release of bass. All fish were sublegal (300 mm), ranging from 120 mm to 290 mm.

Other fish introductions included 9,000 tiger muskie Esox lucius x E. masquinongy for Mud Lake and bluegill Lepomis macrochirus, and bass for the City of Rexburg pond.

Through the tournament process, we have continued to collect trend information on Mud Lake and Ririe Reservoir bass populations. Catch rates for legal (300 mm) largemouth bass Micropterus salmoides at Mud Lake were 13.6 h/fish in 1991 versus 11.3 h/fish in 1990. The decline was partially due to extended

cold weather in April and May 1991. Ririe Reservoir smallmouth bass catch rates were 7.6 hours per legal bass in 1991 versus 11.1 h/fish in 1990 and 17.7 h/fish in 1989.

Beginning in March, a major fish kill occurred at Henrys Lake due to low dissolved oxygen levels. An undetermined number (in excess of 10,000 trout) of mature and juvenile cutthroat and rainbow x cutthroat hybrids died. Temporary aeration facilities were installed at Staley Springs, Wild Rose Resort, Hatchery Creek and Pittsburgh Creek. Ice-out occurred May 22, 1991, and we sampled with experimental gill nets to evaluate fish survival following low oxygen winter conditions. Gill net data indicated all sizes of trout present, and we made a decision to open the season on May 25 as scheduled without bag restrictions.

Island Park gillnetting continues to indicate high levels of chubs and suckers with poor survival of rainbow x cutthroat hybrids stocked since 1989. Random creel census during summer 1991 indicated catch rates of 0.2 to 0.3 fish/h with effort down.

Tagging studies for return-to-the-creel of hatchery put-and-take (200-275 mm) rainbow trout were conducted at Ririe Reservoir and continued at Mackay Reservoir. Fish tagged for release at Ririe Reservoir were only 150 to 180 mm, and returns-to-the-creel averaged less than 7% for all groups. Returns for catchables released at Mackay Reservoir indicated improved recruitment of catchables released during October 1991 versus 1990.

Author:

F. Steven Elle
Regional Fishery Manager

R6DJ92

OBJECTIVES

1. To monitor angler success, species composition, and size of fish in harvest for Ririe Reservoir fishery.

2. To monitor age and growth and catch rate trend of smallmouth bass Micropterus dolomieu in Ririe Reservoir. Monitor catch rate trend of largemouth bass M. salmoides in Mud Lake.

3. To monitor trends of game and nongame fish relative abundance at Ririe Reservoir.

4. To establish summer temperature profiles for Ririe Reservoir, Palisades Reservoir, and Gem State Power Pool for evaluation of suitability of smallmouth bass reproduction.

5. To monitor and mitigate for Henrys Lake dissolved oxygen deficiencies and evaluate survival prior to season opener May 25, 1991.

6. To monitor species composition and trout Oncorhynchus sp. abundance and size in Island Park Reservoir.

7. To evaluate return-to-the-creel of hatchery put-and-take rainbow trout O. mykiss in Mackay and Ririe reservoirs.

8. To monitor fish population trends in Roberts Gravel Pond, Rainbow Lake, and Rexburg City Pond.

9. To introduce warmwater fish species into area waters to enhance fishing opportunity without impacting existing fisheries.

METHODS

Ririe Reservoir

Creel Census

A stratified creel census and angler effort survey was conducted from May 25 through August 15, 1991. Due to problems with equipment and temporary employees, the study design was downgraded to a random creel census without evaluation of effort. Anglers were contacted for length of time fishing, number, size and species of fish creeled, residence, and type of fishing method.

Smallmouth Bass Age and Growth

Smallmouth bass were sampled June 10 and 11, 1991 for length and weight, and scale samples were collected from representative age classes. Fish were collected using boat-mounted electrofishing equipment during nighttime periods. Pulsed, direct-current ranging from 200-400 volts and 4-6 amperes was used. Scale samples for larger bass were supplemented from bass caught in club tournaments during June and July 1991.

Species Composition

Experimental gill nets were used to assess relative abundance of game and nongame fish species. Three 60-foot long nets were set on May 10, 1991, one each at Willow Creek, Meadow Creek, and Ririe Dam. The nets were fished overnight (approximately 24 hours) and pulled May 11. All trout were identified by species and measured to the nearest millimeter. A subsample of Utah chubs Gila atraria and Utah suckers Catostomus ardens were measured to the nearest millimeter.

Bass Tournaments

Local bass clubs held 11 tournaments on Ririe Reservoir during 1991. A record of angler effort and catch was recorded for each boat in all tournaments. Anglers were required to record number of legal (>305 mm) and sublegal (<305 mm) smallmouth bass caught and hours fished. The overall season catch rates for legal and sublegal bass were calculated to provide population trend information.

Temperature Profile

A Ryan-Peabody Temp Mentor constant recording thermograph was placed in Ririe Reservoir from April 19 to October 1, 1991. The thermograph was suspended two meters below a floating dock near the dam. Mean daily temperature was recorded to develop a temperature profile to determine relationship to bass reproduction and growth characteristics.

Island Park Reservoir

Species Composition

Twenty-four hour experimental gill net sets were made at standard sites off Bill's Island and the west end of the reservoir near goose platform 47. One

additional set was made in Trudes Bay. Experimental horizontal gill nets 60 feet in length were used in all locations. Nets were set May 21 and pulled May 22, 1991.

We conducted periodic nonstructured creel surveys. Anglers were checked for hours fished, numbers and size of fish creeled, and overall catch rates.

Henrys Lake

A fish kill began at Henrys Lake on March 7, 1991, at the mouth of Hatchery Creek. Hatchery personnel from Henrys Lake responded to falling dissolved oxygen levels with ongoing monitoring of dissolved oxygen using a YSI model 57 dissolved oxygen probe or an Oxyguard Handy dissolved oxygen probe. As fish concentrated near springs and tributary mouths, oxygen levels declined with resulting fish mortalities. Hatchery and management personnel responded by adding water agitators at Staley Springs, Wild Rose Ranch, the mouth of Hatchery Creek, and the mouth of Pittsburgh Creek.

Ice-out occurred on May 22, 1991. To assess trout survival during low winter dissolved oxygen conditions, we made six sets using 150-foot experimental, horizontal gill nets (Figure 1). Three nets were set the afternoons of May 22 and 23 and pulled the following mornings. Fish captured were recorded by species and measured to the nearest millimeter. Live fish were released back to Henrys Lake.

Palisades Reservoir and Gem State Pool

A Ryan-Peabody Temp Mentor constant recording thermograph was placed in Palisades Reservoir and Gem State Pool to develop a temperature profile for each reservoir. The Palisades Reservoir thermograph was located at Pine Basin Boat Club and the Gem State Pool thermograph at York Bridge. The thermographs were in place from May 7 through October 9, 1991. Temperature profiles were created using mean daily readings. Palisades Reservoir data will be used to evaluate potential for future introductions of smallmouth bass. Gem State Pool data will be used to assess spawning potential of smallmouth introduced in this section of the Snake River following 1990 and 1991 introductions. Comparisons to Ririe Reservoir are made for comparison with an established reproducing smallmouth bass population.

Roberts Gravel Pond

Two 60-foot experimental gill nets and a fyke trap net were set at Roberts Gravel Pond on June 3, 1991, to monitor species composition.

R6DJ92

RIRIE RESERVOIR

Smallmouth Bass

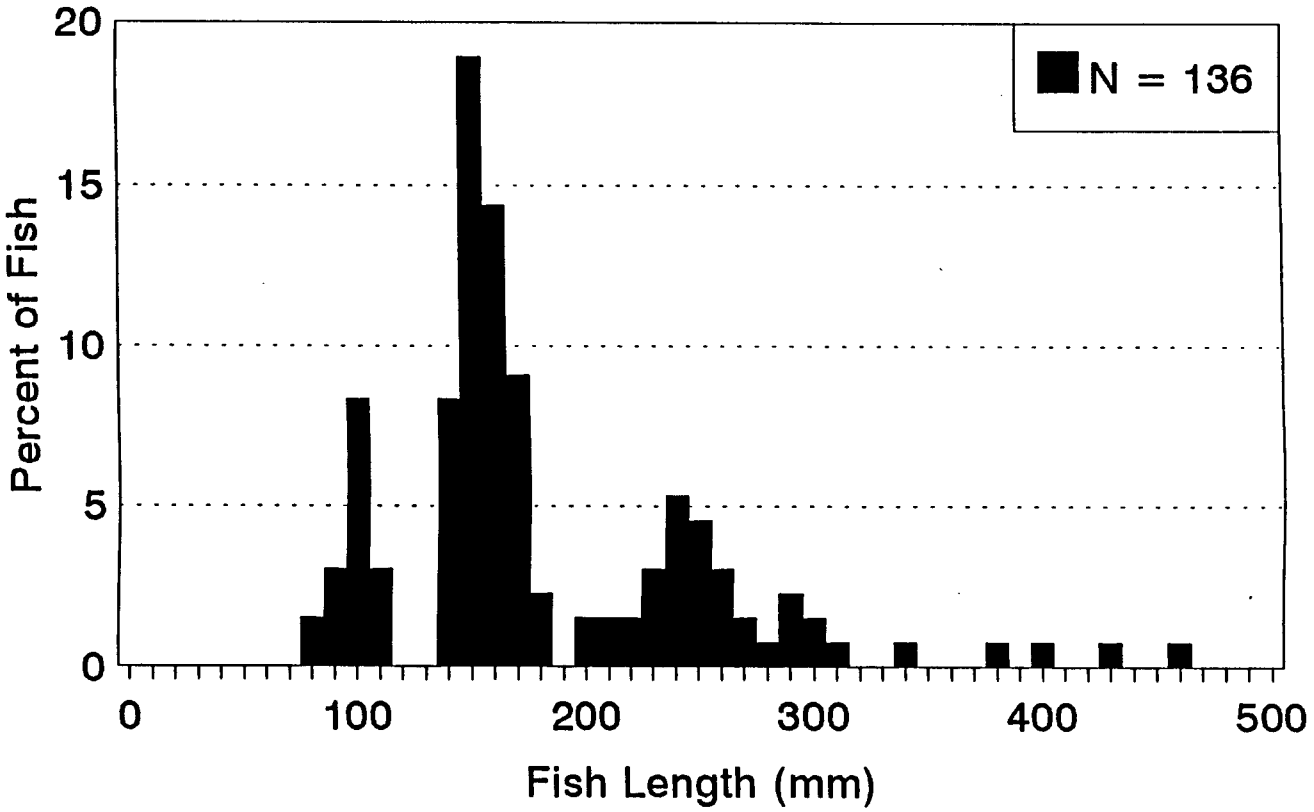


Figure 1. Length-frequency for smallmouth bass collected from Ririe Reservoir during June 18 and 19, 1991.

Mud Lake

Local bass clubs held six tournaments on Mud Lake during 1991. Anglers were required to record similar information described for Ririe Reservoir tournaments.

Rainbow Lake

Two 60-foot experimental gill nets were set at Rainbow Lake on June 4, 1991, to monitor species composition.

Hatchery Put-and-Take Evaluations

Mackay Reservoir

Evaluation continued for recruitment of hatchery trout (200 to 350 mm) released in 1990. Fish were tagged with size 8 monel metal mandible tags prior to release in 1990. Tag returns in 1991 and 1992 represent long-term contribution of 1990 releases.

An additional 50 rainbow trout were tagged and released in October 1991 to retest return-to-the-creel of the late release group which had poor performance results through fall 1991. Baseball caps were again used for rewards to anglers for returning tags.

Ririe Reservoir

We used reward-tagged hatchery put-and-take rainbow to evaluate return-to-the-creel of fish stocked in 1991. Fish were marked using size 8 monel metal mandible tags. Releases were made May 7, July 9, July 22, and September 4, 1991. Three hundred tagged trout were included in each release.

Warmwater Species Introductions

The Fisheries Bureau maintained a warmwater collection crew through June 30, 1991. The crew collected smallmouth bass from Brownlee Reservoir for release in the Snake River impoundments at Idaho Falls.

R6DJ92

RESULTS

Ririe Reservoir

Creel Census

Angler creel checks from May 25 through August 15, 1991 indicated an average catch rate of 0.4 fish/h creeled. The observed catch rate of creeled fish was much lower than prior years' checks: 0.75 fish/h in 1989, 0.75 in 1987, and 0.71 in 1986.

Species composition for creeled fish equaled 40% fingerling hatchery rainbow, 39% smallmouth bass, 19% put-and-take size hatchery rainbow, and 2% kokanee O. nerka. Fifteen percent of the smallmouth bass caught were creeled by anglers. The majority were less than the legal minimum size (305 mm). Catch of bass continues to increase in Ririe Reservoir. The 1991 data indicates a major drop in species composition of hatchery put-and-take size rainbow.

Mean lengths of fish creeled equaled 247 mm for put-and-take rainbow, 288 mm for fingerling rainbow, and 327 mm for smallmouth bass (305 mm minimum length limit). Mean lengths are similar to prior years except for put-and-take origin rainbows. Seven kokanee were checked with an average length of 316 mm.

The decline in catch rates and size of hatchery put-and-take rainbow reflects the substandard size of fish provided from Hagerman Hatchery in 1991. Rainbow releases on July 9 and July 22 average 150 to 180 mm (6-7 inches) versus 200 to 250 mm (8-10 inch) size requested. Anglers either did not catch or did not keep the smaller hatchery fish. Kokanee salmon were introduced in place of coho O. kisutch beginning in 1989. Although few of these fish were caught, the mean size (316 mm) is 30 mm larger than coho averaged in the past.

Yellow perch Perca flavescens, were caught by anglers for the first time in 1991. Perch harvest occurred primarily in the south end of Ririe Reservoir.

We repeatedly had boat motor problems which compromised the census counts and interviews. Additionally the temporary employee acting as census clerk exhibited poor motivation, and the overall results are in question due to effort exerted to collect data.

Smallmouth Bass Age and Growth

We sampled 136 smallmouth bass during June 18 and 19, 1991. Fish length ranged from 77 mm to 463 mm (Figure 1). As part of a statewide survey of smallmouth bass populations, Jeff Dillon (Research section) analyzed scale samples for length at age for Ririe Reservoir. The Ririe bass population had average growth rates compared with 11 other populations statewide in Idaho (Table

1). Growth of larger bass (age 5 and older) at Ririe Reservoir was higher than average, possibly as a result of abundance of Utah chubs which provide ample forage.

The primary limiting factor to Ririe Reservoir smallmouth bass growth is temperature (Jeff Dillon, personal communication). Ririe Reservoir is at 5,200 feet elevation and has a relatively short growing season (days over 10°C). Despite the restricted growing season, successful reproduction and average growth are present at Ririe Reservoir.

Species Composition

Nongame fish dominated the catch from three gill nets fished at Ririe Reservoir May 10, 1991 (Table 2). Utah chubs comprised 71% of the catch, suckers 27%, and game fish only 2%. Few rainbow and no brown trout were captured. The length frequency of Utah chubs did not indicate a reduction in 1991 to 230 mm fish as in 1990 (Figure 2). Results from 1990 seemed to indicate bass predation was beginning to reduce numbers of smaller chubs. Neither the 1991 gill net data nor electrofishing results support that theory. Although bass predation does not appear to affect species composition, anglers report bass are preying on Utah chubs.

Yellow perch were caught in nets for the second year. During electrofishing in June, we captured seven perch from 87 to 182 mm, representing several different year classes.

The number of cutthroat trout O. clarki captured remains very low. Cutthroat trout numbers are indicative of drought impacts to Willow and Meadow creek populations.

Bass Tournaments

Pocatello and Idaho Falls bass clubs fished a total of 11 tournaments at Ririe Reservoir in 1991. As a permit requirement each participant must keep a diary indicating hours fished and the number of legal (>305 mm) and sublegal (<305 m) bass caught. The 1991 average catch rate equaled 7.3 hours per legal bass and 1.6 hours per sublegal bass (Table 3). The catch rate on legal bass improved for the third straight year at Ririe Reservoir (Table 4). As fishing has improved for smallmouth bass at Ririe Reservoir, the number of tournaments and participants were the highest in the past three years. The catch rate on sublegal fish was similar to 1990.

Smallmouth bass were introduced in Ririe Reservoir by the Idaho Department of Fish and Game (IDFG) in 1984 to 1986. Successful reproduction was initially documented in 1986. Growth data indicate bass require five years to reach 305 mm (legal minimum size). The continued trend of higher catch rates on legal fish

Table 1. Smallmouth bass length at annulus (mm), Idaho statewide.

	Annulus								
Location	I	II	III	IV	V	VI	VII	VIII	IX
Hayden Lake	77	127	181	244	291	323	339	397	421
Dworshak	90	158	209	265	302	337	380	395	418
Waha Lake	83	141	189	237	312	351	388	395	420
Lower Snake									
(1985)	88	154	218	264	304	348	399	436	467
(1991)	78	147	212	274	344	388	--	--	--
Lower Salmon									
(1991)	96	160	212	270	303	--	--	--	--
Hells Cyn River	74	138	190	228	262	291	--	--	--
Oxbow River	79	147	207	239	269	303	327	--	--
Brownlee (1984)	72	157	235	299	353	383	421	468	--
(1991)	45	145	214	248	280	--	--	--	--
C.J. Strike	97	172	235	281	315	--	--	--	--
Anderson Ranch									
(1985)	71	124	180	231	298	354	382	425	--
(1991)	89	173	251	326	365	388	410	--	--
Salmon Falls Creek Reservoir	67	117	172	212	237	270	301	319	--
Ririe Reservoir	83	137	201	254	323	357	392	414	--

TABLES

Table 2. Numbers of fish captured in spring gilinetting surveys (one net night per station), Ririe Reservoir, 1983 to 1991. Note: Length of experimental gill nets reduced from 120 to 60 feet in 1988.

Location	Year	Species[a]								
		RB	WCT	BRN	CO	US	UC	RSS	SMB	Y
Across from Juniper vertical	1983	14	1	1	--	52	24	--	--	
	1983	--	--	1	--	14	--	--	--	
	1985	--	--	--	--	85	--	--	--	
	1986	--	--	--	--	7	--	--	--	
	1987	Discontinued								
Willow Creek horizontal	1984	--	--	--	--	23	5	--	--	
	1985	9	13	--	--	26	86	--	--	
	1986	61	15	--	1	60	126	--	--	
	1987	32	7	--	1	262	242	3	1	
	1988	12	1	--	--	59	88	--	--	
	1989	12	--	--	1	63	326	--	--	
	1990	9	1	--	--	40	46	--	1	1
	1991	1	--	--	--	44	13	--	--	1
Meadow Creek horizontal	1984	2	5	--	--	16	3	--	--	
	1985	--	2	2	--	1	73	--	--	
	1986	5	6	2	--	4	101	--	--	
	1987	14	7	--	3	49	246	--	6	
	1988	7	2	--	--	13	54	--	--	
	1989[b]	1	1	1	--	69	393	--	4	
	1990	1	--	1		66	58	--	--	
	1991	1	1	--	--	75	160	--	--	1
Dam	1986	1	--	--	10	--	5	--	--	
	1987	17	6	1	1	64	81	--	1	
	1988	6	2	--	3	24	49	--	--	
	1989[b]	8	--	--	2	28	156	--	3	
	1990	7	--	--	--	36	104	--	1	
	1991	3	1	--	--	39	241	--	--	

a RB = rainbow trout
WCT = wild cutthroat trout
BRN = brown trout
CO = coho salmon
US = Utah suckers
UC = Utah chubs
RSS = redside shiner
SMB = smalimouth bass
YP = yellow perch.

b Nets set for 48 hours due to inclement weather.

TBLS

Ririe Reservoir

Chubs

1991

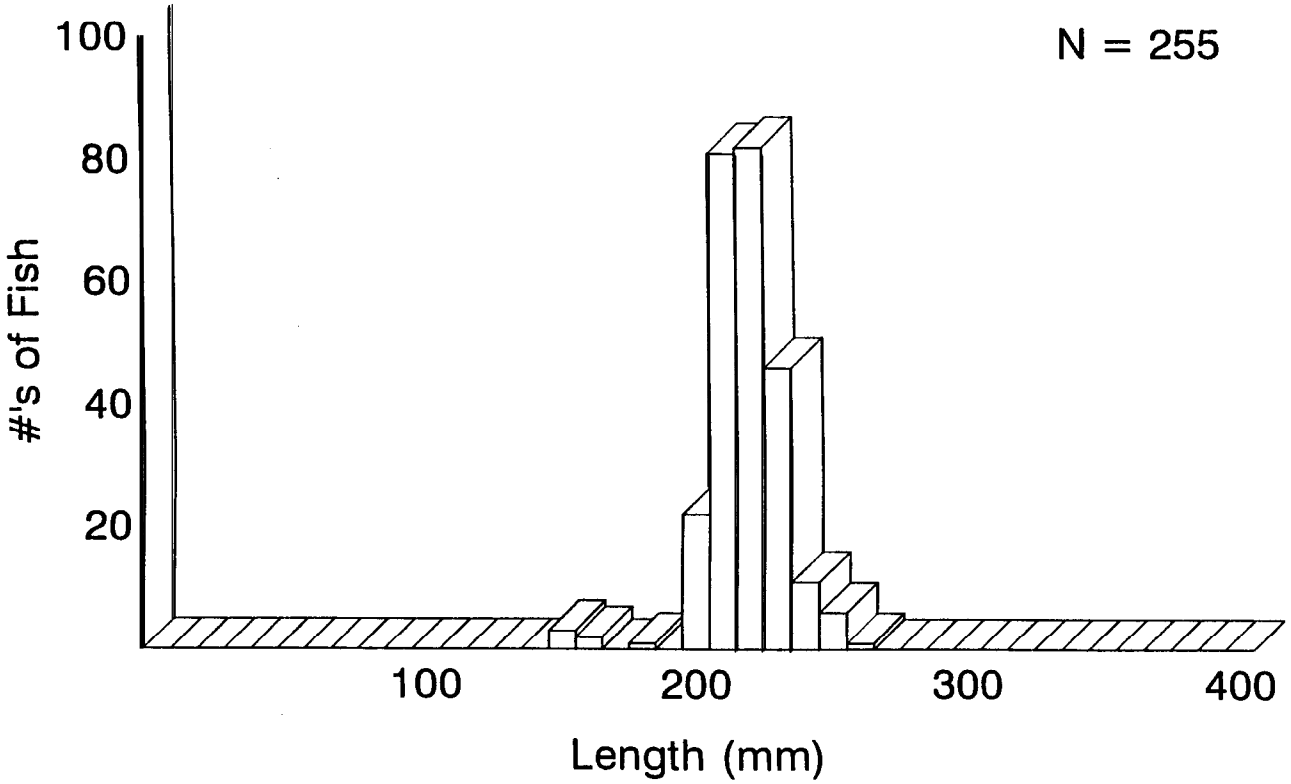


Figure 2. Length-frequency for Utah chubs collected with gill nets at Ririe Reservoir May 10, 1991.

Table 3. Results from Pocatello and Idaho Falls Bass Club tournaments for Ririe Reservoir and Mud Lake during 1991.

Water body	Date	Number anglers	Hours fished	Legal bass	Sublegal bass	Catch Rates (h/fish) Legal (>305 mm)	Sublegal (<305
Ririe Reservoir	6-01	18	160	17	53	9.4	3.0
	6-16	16	158	32	122	5.0	1.3
	6-29	30	300	49	183	6.1	1.6
	6-30	22	198	20	110	9.9	1.8
	7-06	12	106	21	94	5.0	1.1
	7-20	19	160	14	152	11.4	1.1
	7-27	8	75	10	35	7.5	2.1
	8-03	13	114	15	128	7.6	0.9
	8-10	13	130	24	104	5.4	1.3
	8-24	23	198	25	122	7.9	1.6
	9-14	10	90	18	48	5.0	1.9
Mud Lake	4-20	30	285	--	--	--	--
	5-18	11	94	8	--	11.7	--
	5-25	30	291	15	29	19.4	10.0
	5-26	28	266	23	6	11.6	44.3
	6-15	14	126	8	9	15.8	14.0

TABLES

Table 4. Bass tournament summaries for Ririe Reservoir and Mud Lake 1989 through 1991. Data recorded on mandatory report cards.

Water body	Year	Number anglers	Number tournaments	Mean Catch Rate (h{Fish) Legal Bass (>305mm)	Mean Catch Rate (h{Fish) Sublegal Bass (<305 mm)
Ririe Reservoir	1989	106	6	17.7	--
	1990	79	7	11.1	1.3
	1991	184	11	7.3	1.6
Mud Lake	1989	34	4	8.8	--
	1990	136	6	11.3	--
	1991	113	5	19.7	24.1

is indicative of an expanding population, with individuals from natural spawning finally reaching legal size.

Temperature Profile

Mean daily water temperature was monitored during April to October 1991. The profile developed (Figure 3) provides a background for comparison with Gem State Pool, where bass were introduced in 1990 and 1991, and with Palisades Reservoir for possible future introductions.

Water temperatures exceed 10°C during the entire monitoring period. This would indicate growing conditions were present for bass throughout the summer. Smallmouth bass required approximately 17°C for spawning onset. This temperature occurred on July 6, 1991.

Island Park Reservoir

Species Composition

Gill net samples from May 22 and 23, 1991 once again indicate predominantly (95%) nongame fish species composition (Table 5). Utah suckers were the most abundant fish species caught (66%), followed by Utah chubs (29%), and game fish (5%). A large number of the nongame fish are larger than 150 mm and probably not available to game fish as forage.

Creel Census

Limited interviews were conducted in winter (February and March) and summer (May and June) of 1991 at Island Park Reservoir. Past winter fishing produced catch rates approximately 1.0 fish/h with many coho and kokanee salmon caught. In winter 1991, anglers averaged 0.45 fish/h and only caught five kokanee in 162 hours of fishing checked. Observations of the number of anglers fishing indicated effort was down by over 70% in 1991. Summer census indicated a catch rate of 0.2 fish/h. The goal for the reservoir is 0.6 fish/h. Size of wild rainbow harvested averaged 465 mm and these fish comprised only 34% of the harvest. The Department stocked approximately 400,000 rainbow x cutthroat hybrid trout annually in the reservoir since 1989. None of these fish were present in catches we observed.

The catch rate observed in 1991 is similar to 1989 and 1990. Since 1989 we have adjusted timing, size, and location of hatchery releases. None of these actions have improved the sport fishery, and angler participation continues to be less than half the level observed during the 1970s and early 1980s.

R6DJ92

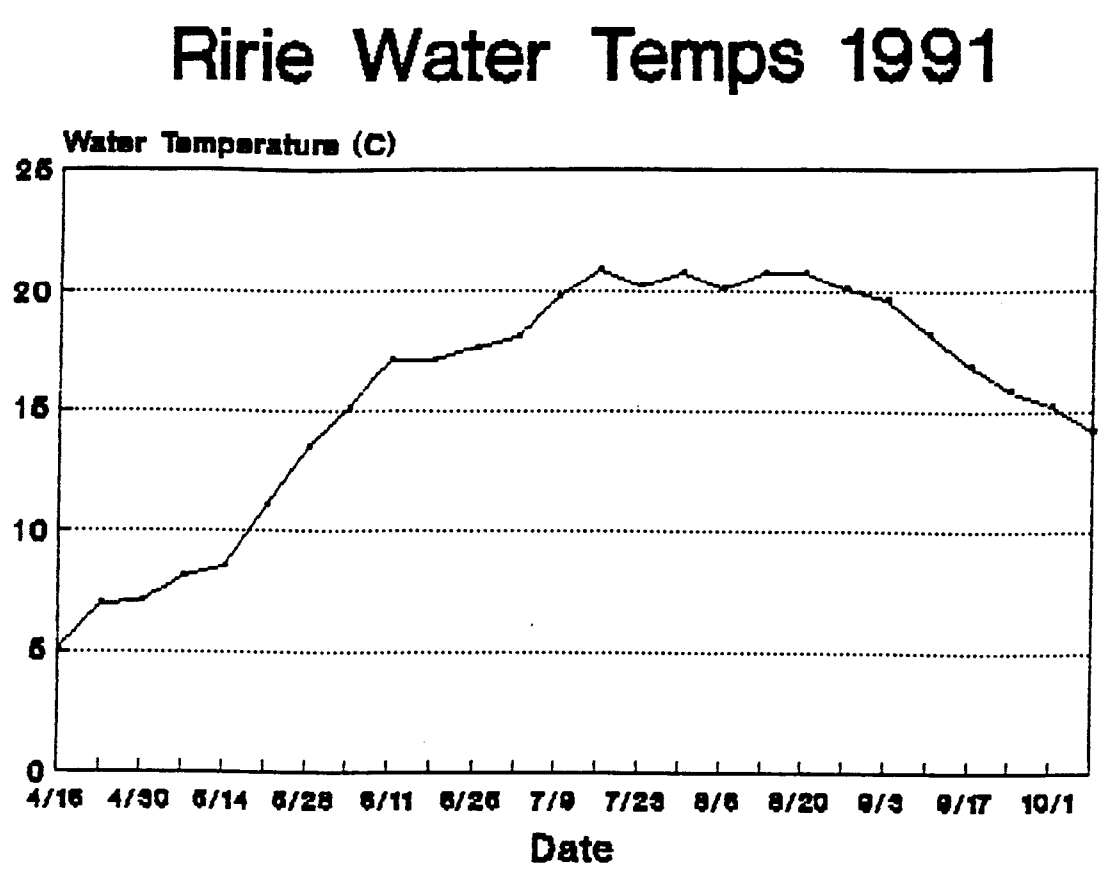


Figure 3. Temperature profile for Ririe Reservoir from April 19 to October 9, 1991.

Table 5. Species composition for Island Park Reservoir based on three 60-foot experimental mesh horizontal gill nets fished May 22, 1991.

Location	Species[a]	Number	Range in Length (mm)
Trudes Bay	UC	12	140-331
	US	28	291-515
	HRB	3	306-353
	WRB	1	467
	WF	1	400
West End	UC	5	150-283
(Goose Platform #49)	US	26	288-507
Bills Island	UC	35	131-327
	US	65	147-504
	BRK	2	225-337
	HRB	2	281-335

UC = Utah chub
US = Utah sucker
HRB = hatchery rainbow trout
WRB = wild rainbow trout
WF = whitefish
BRK = brook Trout

Henrys Lake

Dissolved oxygen (DO) levels declined during the winter of 1990-91 until fish were noticed dying at the mouth of Hatchery Creek on March 8. A detailed account of the observations, monitoring, and physical efforts to address declining oxygen levels at Henrys Lake was prepared by Jerry Chapman, Fish Hatchery Superintendent, Ashton Hatchery (Appendix A). Fish concentrated at the mouth of Hatchery Creek were staging for spawning. DO levels equaled 3.0 ppm along the shoreline, with 4.5 ppm in the ladder and 6.5 ppm in the spawn house. Monitoring on March 11 indicated low DO levels (1.7 to 3.5) around the lake, with the exception of Staley Springs (7.0 ppm). Aerators were placed at the mouth of Hatchery Creek, and DO levels rose to 4.5 - 5.0 ppm. On March 20, DO monitoring indicated depressed readings at all locations, including Staley Springs which had dropped to 3.6 - 3.9 ppm. An all-out effort was launched to install electrical services and place aeration units at open water areas. Three floating aerators and a hydraulic compressor were placed at Staley Springs. Two floating and two propeller aerators were placed at Wild Rose. Five units were placed at Hatchery Creek and three at Pittsburgh Creek Harbor. These measures resulted in improved localized conditions where concentrations of fish existed.

Byron White, with Henrys Lake Foundation, had assisted our Department with establishing baseline water quality data during winter 1990. He volunteered to duplicate DO samples in 1991 for comparative purposes. His data (Appendix B) indicates a significant reduction of DO levels throughout the lake in 1991 compared to 1990.

A combination of factors contributed to the oxygen depletion during the winter of 1991. Low flows from surface tributaries and in-lake springs due to prolonged drought conditions greatly reduced total lake inflow. An early onset of winter ice cover and a deep snow cover during November 1990, coupled with the latest spring on record for ice melting off the lake, produced a longer period of oxygen consumption in the lake. Summer home development with septic drain fields on the north and west shores and agricultural runoff from livestock production adjacent to Henrys Lake are increasing nutrient loading of an already eutrophic system. And drought conditions have reduced flushing through the lake in the past four years.

Ice-out occurred at Henrys Lake on May 22, 1992. We set gill nets to evaluate survival of juvenile trout following the two months of low DO conditions (Figure 4). Results indicated the presence of all species and multiple age classes of fish (Table 6) (Figures 5, 6 and 7). Most of the brook trout were age 0+ and 1+. Based on the gill net data, we conclude a number of refuge areas exist near the mouth of tributaries or at in-lake springs. We assume these areas provided the higher DO levels necessary for fish survival when most of our DO readings indicate less than 3.0 ppm around the lake.

R6DJ92

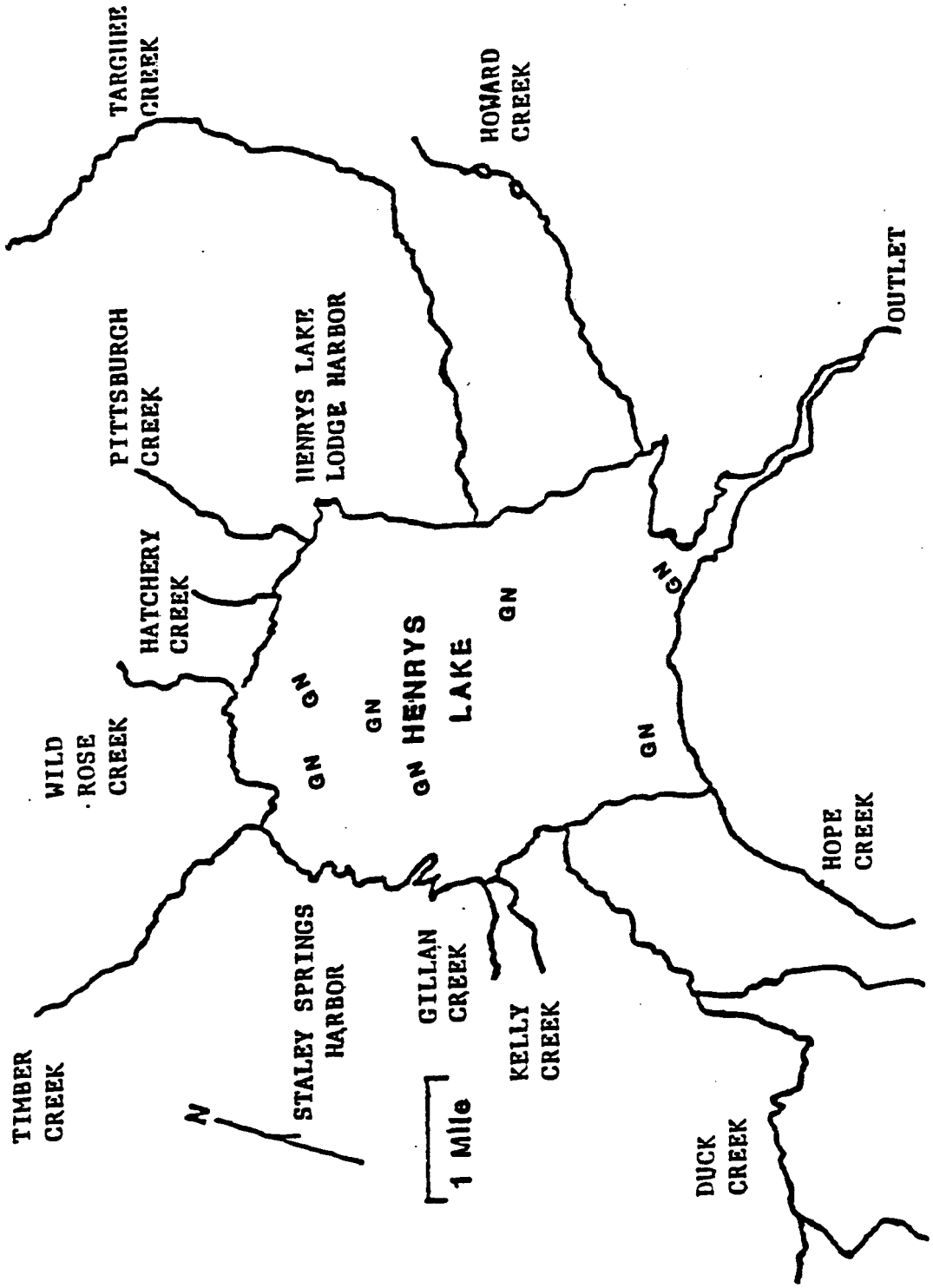


Figure 4. Map of Henrys Lake showing gillnet sample location for May 1991.

Table 6. Results of Henrys Lake gill net surveys, May 22 and 23, 1991.

Location	Date	Species Composition			
		WCT	WCT x WRB	BRK	RSS
Timber Creek	5/22	4	4	1	1
Wild Rose	5/22	15	9	3	--
Kinney Creek	5/22	--	1	--	--
County Dock	5/22	12	2	3	--
A-Frames	5/23	4	4	4	1
Targhee Creek	5/23	1	--	--	--
Cliffs	5/23	8	6	5	--

[a] WCT = wild cutthroat trout
WRB = wild rainbow trout
BRK = brook trout
RSS = redside shiner

HENRY'S LAKE GILLNETS 1991

Wild Cutthroat Trout

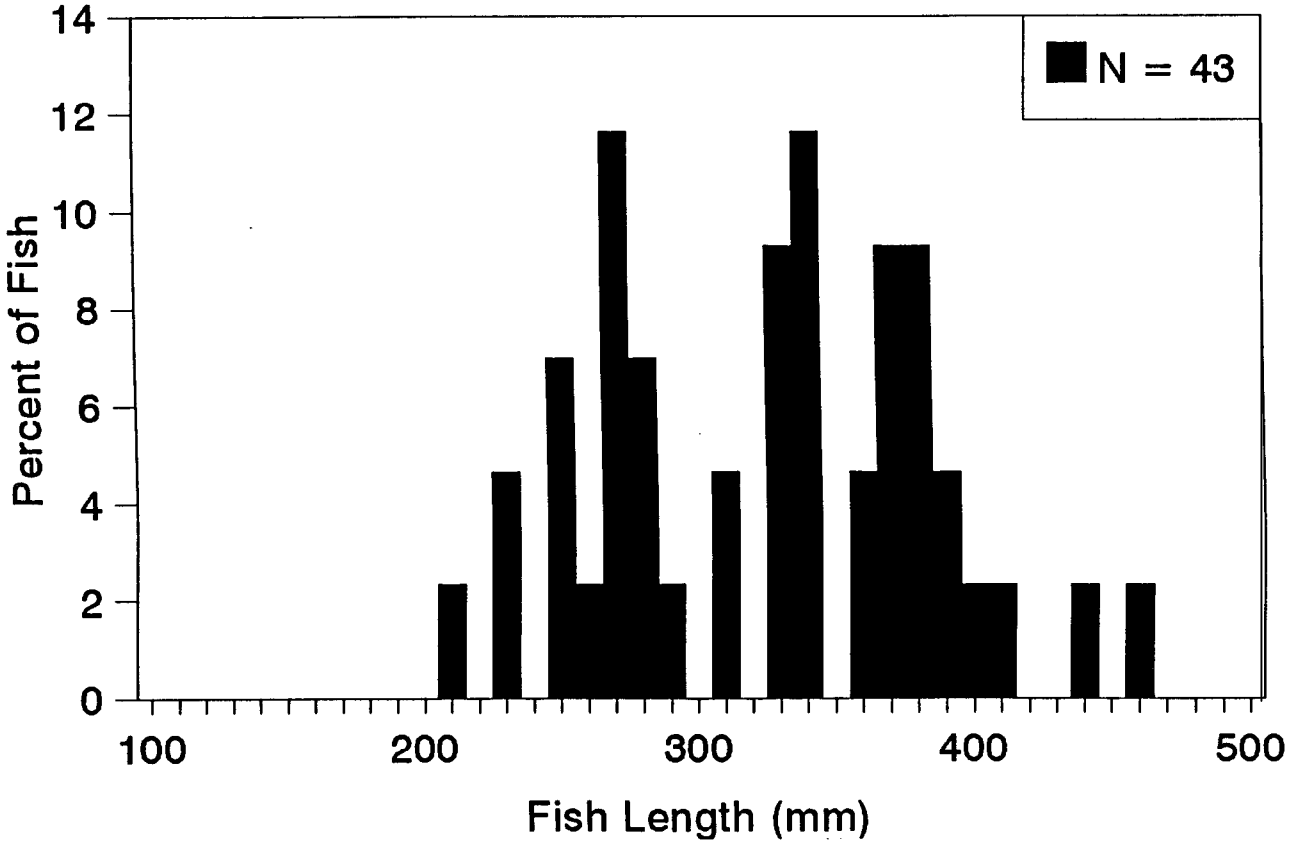


Figure 5. Length-frequency for cutthroat trout captured with gill nets during May 22 and 23, 1991, at Henrys Lake.

HENRY'S LAKE GILLNETS 1991

Hybrid Cutthroat Trout

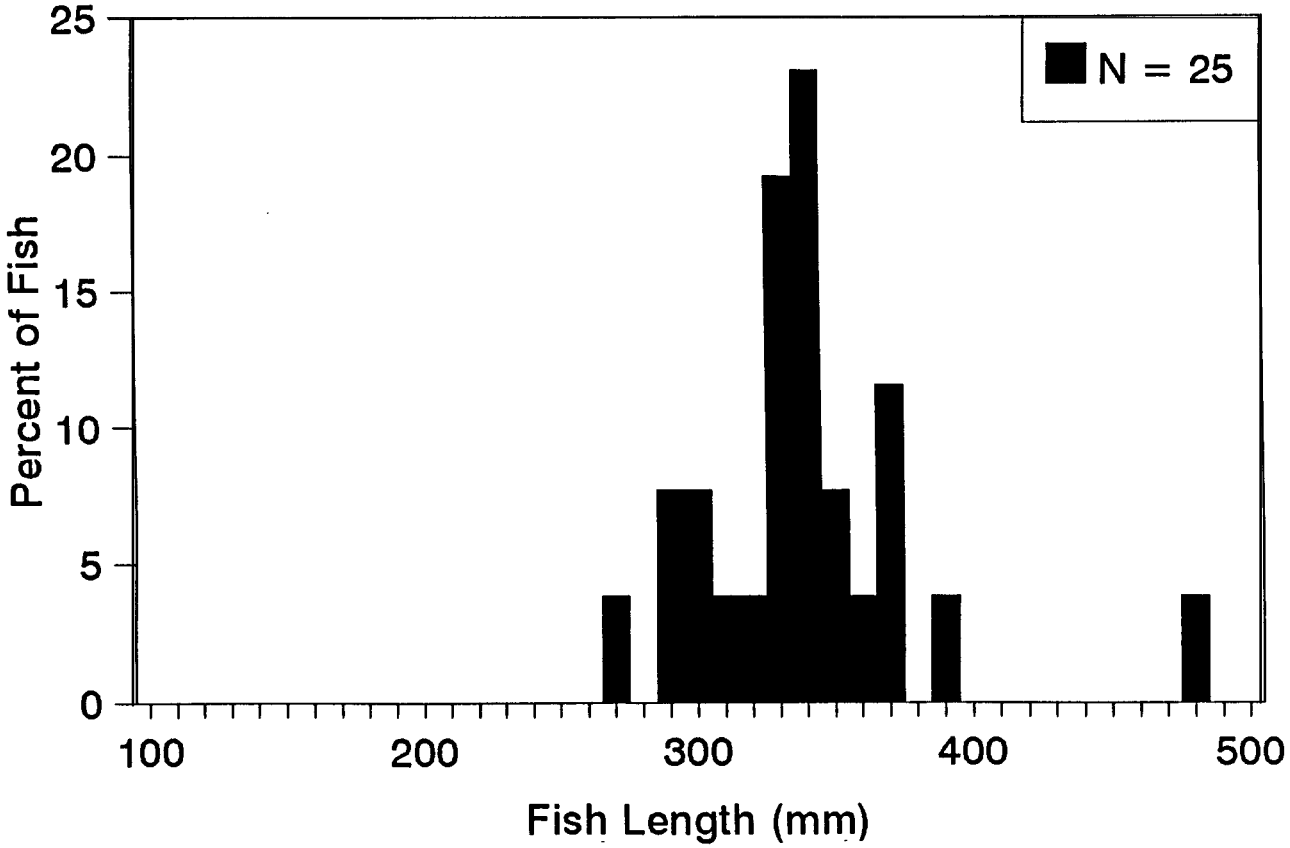


Figure 6. Length-frequency for rainbow x cutthroat trout captured with gill nets during May 22 and 23, 1991, at Henrys Lake.

HENRY'S LAKE GILLNETS 1991

Brook Trout

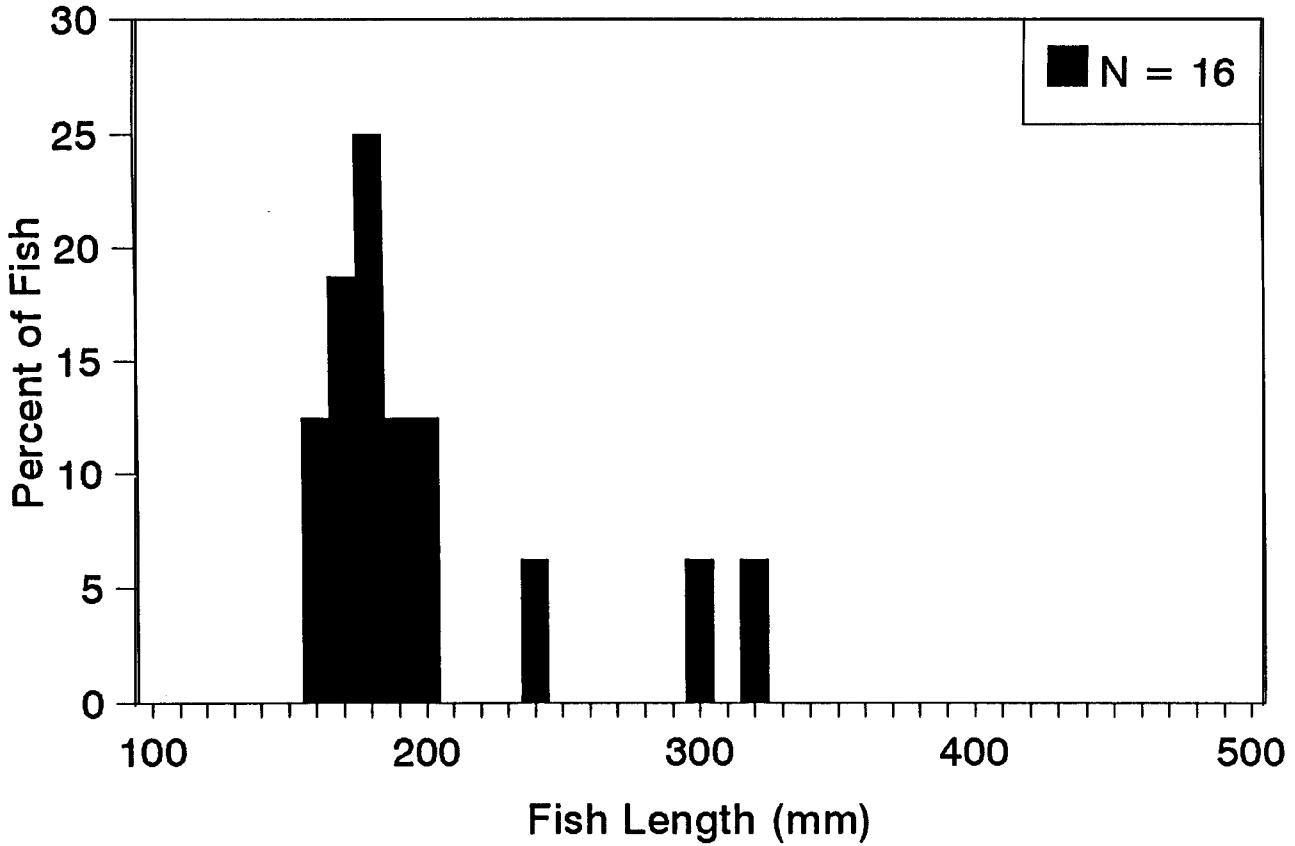


Figure 7. Length-frequency for brook trout captured with gill nets during May 22 and 23, 1991, at Henrys Lake.

Palisades Reservoir and Gem State Pool

Temperature monitoring was conducted in these two water bodies to evaluate limitations to potential smallmouth bass reproduction. Palisades Reservoir is managed only for coldwater fishes. At present, the fishery is maintaining only a 0.2 to 0.3 fish/h catch rate. If future management actions cannot improve this fishery, introductions of smallmouth bass may be considered in light of successful introduction at Ririe Reservoir. The temperature profile for 1991 indicates Palisades Reservoir reaches similar maximum temperatures compared to Ririe Reservoir, but lags behind in Ririe attaining those temperatures by about one week (Figures 3 and 8). Temperature data indicate Palisades could potentially sustain smallmouth bass reproduction despite the elevation of 6,200 feet and limited growing season.

Gem State Pool is a run-of-the-river hydroelectric impoundment on the Snake River near Idaho Falls. smallmouth bass were introduced into the area in 1990 and 1991 with the intent of establishing reproducing populations. Temperature data at Gem State Pool indicate temperatures do not get as warm and fluctuate more than Ririe Reservoir (Figures 3 and 9). The temperature did not reach 16° to 18°C (spawning temperature) until July 15. This would indicate if smallmouth reproduction does occur, it may be too late in the season to produce enough growth for overwinter survival of young-of-the-year (YOY) bass. Warmer waters may exist in the backwater areas behind the City of Idaho Falls power dams. These areas may provide spawning habitat refuges.

Roberts Gravel Pond

Gill net results at Roberts Gravel Pond indicated the presence of brown bullheads Ameiurus nebulosus and hatchery rainbow trout. The bullhead were small, ranging in length from 152 to 185 mm. Hatchery rainbow were present in fair numbers three months following release. No channel catfish Ictalurus punctatus, yellow perch, or largemouth bass were captured. The fyke trap net captured no fish.

Mud Lake,

Five tournaments were held at Mud Lake for largemouth bass in 1991. Catch rates for legal fish continued to decline compared to 1989 (Tables 4 and 5). A cool, late spring in 1991 affected catch rates, especially the tournament on April 20.

R6DJ92

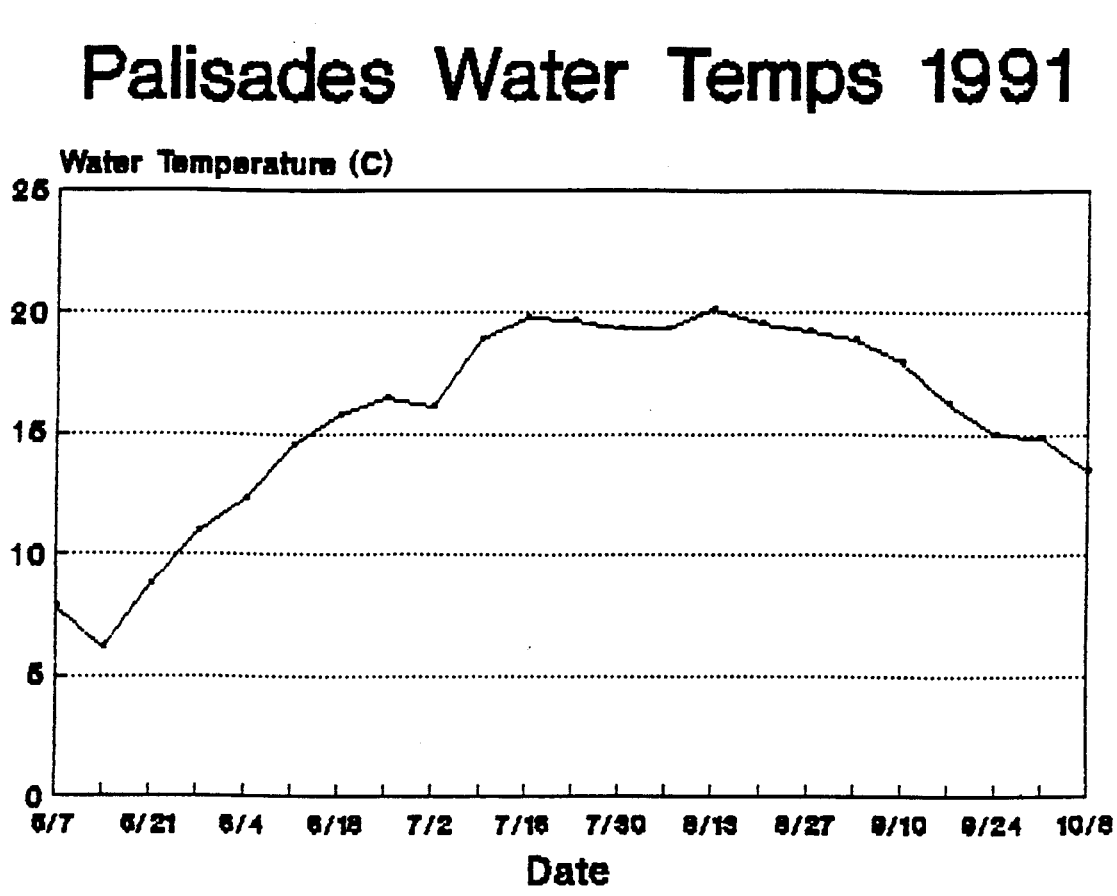


Figure 8. Temperature profile for Palisades Reservoir from May 7 to October 7, 1991.

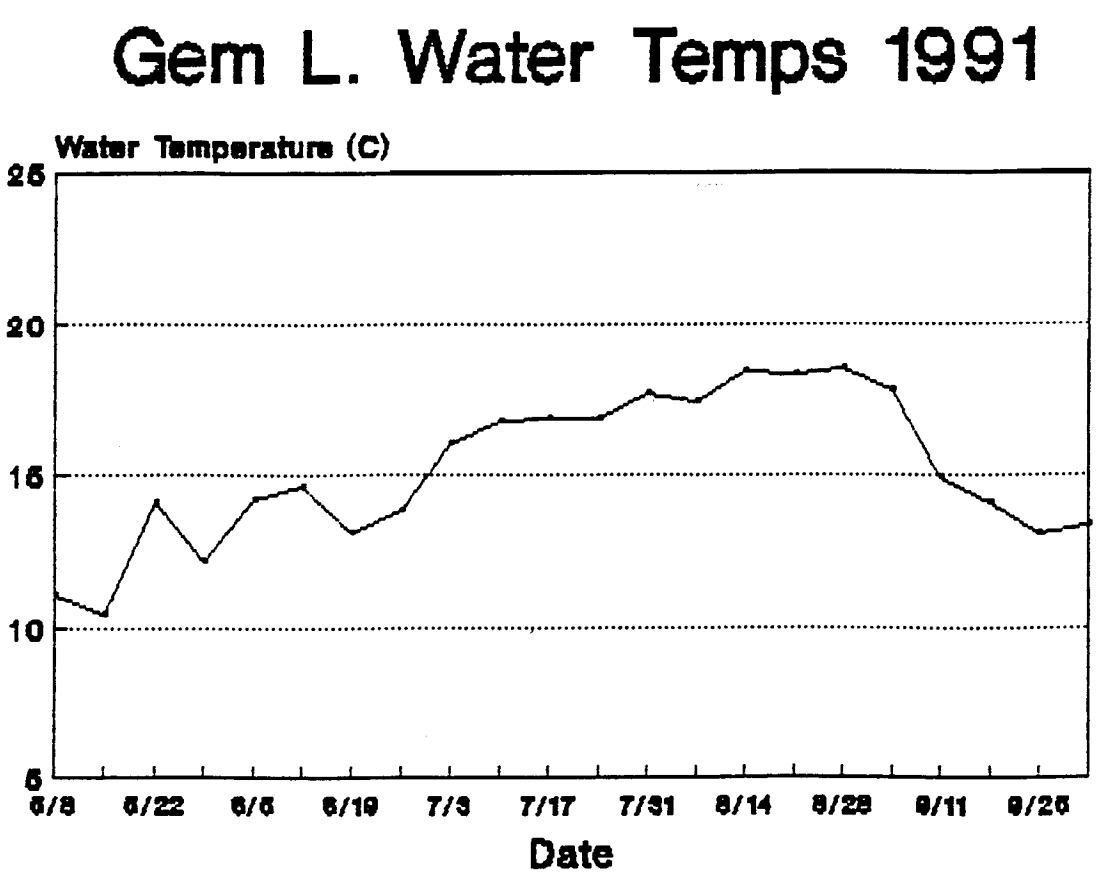


Figure 9. Temperature profile for Gem Lake Pool from May 7 to October 7, 1991.

Rainbow Lake

Gill net results at Rainbow Lake indicated rainbow trout and redside shiners Richardsonius balteatus present in high numbers. The mean length for rainbow sampled equaled 128 mm (range 110-177 mm). Fish stocked in the fall of 1990 at 80 to 120 mm had not exhibited much growth. The abundance of shiners may represent a source of competition for zooplankton. One large brown trout (790 mm) was captured, most likely from private fish releases by the pond owner prior to 1988.

Hatchery Put-and-Take Evaluations

Mackay Reservoir

Fish tagging studies during 1990 indicated a poor return of rainbow stocked during October for winter and early spring fishing opportunity. Total returns from October 1990 fish releases were only 10%, with only 4% carryover harvest the following summer (Table 7). Returns from 50 tagged rainbow released in October 1991, had return rates of 24% in 1992. No tagged fish released in 1990 were caught during 1992.

Ririe Reservoir

Tagged rainbow trout released at Ririe Reservoir in 1991 had a total reported return rate of 5.3% (Table 8). Returns were approximately equally distributed in 1991 and 1992. Few tagged trout were captured after early July 1992.

Return rate data is possibly affected by size of rainbow released. Anglers prefer to keep fish 200 mm (8 inches) or larger. The fish from the two July releases were 150 to 180 mm average length. However, the larger fish released in May and September had very similar return rates. None of the tagged fish from May 1991 were caught during 1992. Past creel census surveys and this data indicate relatively poor return-to-the-creel at Ririe Reservoir for put-and-take rainbow.

Warmwater Species Introductions

The Boise warm water collection crew collected and transported smallmouth bass for the Snake River impoundments through Idaho Falls. Fish were collected in Hells Canyon and Oxbow reservoirs. Releases in the Idaho Falls area included: 800 in the Gem State Pool, 500 in the Lower Power Plan Pool, 400 above the Broadway Power Plant, and 400 in the Upper Power Plant Pool. This was the second

Table 7. Return-to-the-creel of hatchery put-and-take rainbow trout stocked at Mackay Reservoir in 1990 and 1991, as determined by angler returns of reward jaw tags.

Date released	Percentage returned-to-the-creel			
	1990	1991	1992	Total
4/4/90	12.5	--	--	12.5
4/19/90	25.0	--	--	25.0
5/3/90	35.0	5.0	--	40.0
5/15/90	30/0	--	--	30.0
5/30/90	34.0	--	--	34.0
6/6/90	35.0	--	--	35.0
6/13/90	57.5	--	--	52.5
6/19/90	40/0	2.5	--	42.5
6/28/90	37.5	5.0	--	42.5
7/3/90	42.0	4.0	--	46.0
7/11/90	38.0	--	--	38.0
7/18/90	48.0	2.0	--	50.0
7/24/90	40/0	4.0	--	44.0
11/26/90	--	8.0	--	8.0
11/27/90	--	11.0	--	11.0
11/7/91	--	--	24.0	24.0
Totals	25.5	3.5	1.4	30.4

Table 8. Return-to-the-creel of hatchery put-and-take rainbow trout stocked at Ririe Reservoir in 1991, as determined by angler returns of reward jaw tags.

Date released	Percentage returned-to-the-creel		
	1991	1992	Total
5/7/91	5.3	--	5.3
7/9/92	3.7	2.0	5.7
7/22/91	3.7	2.7	6.4
9/4/91	2.0	2.0	4.0
Totals	3.7	1.7	5.4

and final year of introductions designed to initiate self-sustaining populations. Fish released ranged in size from 100 to 280 mm. Additional releases of warmwater species included 500 (200 mm) channel catfish to Roberts Gravel Pond and 7,000 tiger muskie Esox lucius x E. masquinonav to Mud Lake.

RECOMMENDATIONS

1. Kokanee stocked in 1990 in Ririe Reservoir should recruit to the fishery in 1992. Monitoring the fishery should be done to evaluate size and catch rate of kokanee in the angler creels. Also monitoring of shores and tributaries should be completed for size and numbers of spawners, and if any successful spawning occurs.

2. Returns of put-and-take sized rainbow at Ririe Reservoir do not justify continued stocking based on 1991 and 1992 tag returns. However, the removal of 59,000 rainbow trout from a popular fishery represents a potential major reduction to the fishery. We recommend the following steps for evaluation prior to discontinuing all put-and-take stocking at Ririe Reservoir. In 1993, stock no put-and-take rainbow trout and monitor catch rates. In 1994, request 20,000 300 mm (12 inch) size rainbow for release in May (10,000) and June (10,000). These fish should be tagged for evaluation.

3. Conduct a lowland lake survey on Ririe Reservoir to provide data base for management decisions.

4. Island Park Reservoir fishery continues to not meet management goals. Competition from nongame fish may be limiting survival of hatchery-released fish. A series of management efforts should be installed including: stocking of Lahonton cutthroat trout as a predator to utilize nongame fish, allowing commercial removal of nongame fish, and pursuing a fish eradication effort if conditions permit. A Lowland lake survey in conjunction with the Research Section should be undertaken.

5. A study to evaluate Henrys Lake nutrient loading has been initiated. We will participate in the study and support measures to reduce nutrient input to Henrys Lake. We will pursue design and construction of a major aeration system for installation near the Hatchery Creek fish ladder.

6. Continue spring gillnetting at Henrys Lake to monitor age class and species composition.

R6DJ92

A P P E N D I C E S

Appendix A. Chronological record of conditions and Idaho Department of Fish and Game response to low dissolved oxygen situation at Henrys Lake, 1991. Record developed by Jerry Chapman, Fish Hatchery Superintendent, Ashton Hatchery.

Henrys Lake Fish Kill
Order of Events

March 8 Normal spawning mortality (30 fish) noticed at mouth of ladder.

March 10 Noticed 300-500 dead and dying fish with flared gills at mouth of ladder. Brad George notified Ashton Hatchery immediately. Ashton Hatchery personnel drove up and took DO and water samples using probe and Hach kit. Readings of 3.0 ppm detected in lake around ladder, with 4.5 actually in the ladder at the mouth. DO's of 6.5 detected coming out of spawnhouse so assumed lake problem. Region 6 fisheries (Gamblin) and Boise (Larkin) were contacted.

March 11 Chapman, Elle and Gamblin hooked up blower to open ice in front of ladder. Elle and Chapman snowmobiled around lake for DO samples (listed below).

20 yards off Wild Rose = 1.7
70 yards off Wild Rose = 3.0
100 yards off Wild Rose - 3.5
Staley Springs in bay = 7.9
Staley Springs off point 20 yards = 1.7 - 1.9
Duck Creek - 9.9
Hatchery Ladder = 3.0

Spawning continued. Chapman hauled 300,000 eggs back to Ashton. Electrician was contacted to wire for aerators at ladder.

March 12 Electrician wired ladder area for aerator use. Chapman brought three aerators from Ashton and installed at mouth of ladder after blower opened area up. Sorted fish.

March 13 Electrical problems encountered*. Contacted Fall River Electric and electrician to fix problem. Sorting and spawning continued.

March 14 Aerators in operation. Fish sorting continued.

March 16 Chapman took DO's at ladder -- improved to 4.5 - 5.0 ppm and mortality down to 50 per day around ladder.

R6DJ92

March 14-20 Aerators in operation. Ice chopping continued to open areas near shoreline around ladder -- 70 yards both sides, 40 yards out. Brad and Russ picked up and hauled 3,100 dead cutthroat and cutthroat hybrids to landfill. Continued sorting and spawning. Boise apprised as developments occurred. Noticed decline in ripe fish arriving in the ladder.

March 20 Chapman and George took DO readings around lake again. Sorting continued.

Ladder = 4.5 - 5.2 ppm
Bottom of ladder = 6.5
Wild Rose bay = 0.3
Wild Rose, out 40 yards = 1.6
Wild Rose, out 140 yards = 1.3
Wild Rose sewer drains (open water) = 4.5 - 5.1
Staleys, in bay = 3.6 - 3.9
Staleys, off point = 1.1
Note: March 11 sample in this area, very few fish were noticed in spring area. Today, many fish (50) were observed. All fish had severe fungus problems. It appears fish have sought spring area for higher DO concentrations and are depleting DO in bay.
Duck Creek = 10.1
Cliffs, 60 yards = 1.9
Cliffs, 160 yards = 1.8
Outlet = 1.5
State Park = 1.9
Howard Slough Bridge = 2.7
Targhee Creek, 50 yards out = 6.8
Targhee Creek, 1/2 mile out = 1.2
Pittsburgh Creek = 9.5
Pittsburgh Creek bay = 2.9 - 3.8

March 21 Opened Staley Springs road. Electrician wired Pittsburgh Creek. Installed blower to open ice in Pittsburgh Creek harbor. Brad chopped ice to install aerator. Chapman hauled last aerator from Ashton and installed in harbor.

March 22 Sorted and spawned fish. Electrician to wire more outlets at Pittsburgh Creek and Staley Springs. Water pumps, air pumps, aerators and generators to be delivered today for immediate installation. Operation to be continued with 13 more aerators and blowers to arrive in next few days.

R6DJ92

*An additional 1,000 dead fish were observed from Pittsburgh Creek to Hatchery Creek.

Installed wiring on Staley Springs for three 100 aerators. Hooked up two floating 1 hsp. aerators in Staleys. Put up big compressor from Elle/Blackfoot. Hooked up three trash pumps to open water around north shore. Put powerhouse box aerators together.

March 23 Put powerhouse aerator in Pittsburgh bay.
Put Fresh-f to aerator below cabin.
Hooked up trash pumps for six hour service with extra gas can.
Unloaded supplies from Howard Brown and Steve Pogue. Installed three Fresh-f to aerators in Staley Springs.
Hooked up large Blackfoot compressor with four air hoses into Staley Springs.
Moved supplies to get out of heavy snowfall.
Maintenance on compressor at Staley Springs.
Bill Schiess and friend took DO readings:

Mouth of Targhee Creek = 7.3
1/2 mile west of Targhee Creek = 1.8
Wild Rose bay - west of harbor = 1.1
Mouth of creek in Wild Rose bay = 0.25

Byron White of I.S.U. took his yearly winter DO readings. Results below compare 1990 with 1991.

	1990	1991
Goose Bay	6.1	1.6
In front of hatchery cabin	4.1	4.6*
Pintail Point	6.5	0.81
Pittsburgh Bay	6.2	3.1*
Wild Rose Hybrid Hole	6.2	3.1
Duck Creek - In lake	6.2	

*after aeration

March 24 Sorted cutthroat in spawnhouse.
Assembled and installed two powerhouse aerators in front of cabin.
Refilled all trash pumps and relocated two of them.
Unloaded gear from Clearwater hatchery.
Maintenance on compressor and trash pumps.

March 25 Rewired broken aerator.
Rewired 200 aerators to 110.
Installed trash pump at Pittsburgh Bay.

Moved powerhouse aerator in Pittsburgh Bay closer to icepack.
Installed trash pump at Wild Rose to eat hole in ice.
Maintenance on Staley Springs compressor and trash pumps.
Introduced Jay Barber (American Falls) and Doug Engemann (Mackay) to life in the fast lane.
Sorted and spawned cutthroat.

March 26 Opened three holes at Wild Rose with backhoe for aerators, courtesy of Dean McNee (the guy who was misquoted by newspaper as saying there is no fish kill in Henrys Lake).
Installed two powerhouse aerators in holes at Wild Rose, no more power available. Electrician to install 100 and 220 capability.
Pump borrowed from Blackfoot installed in Pittsburgh Bay -- found out it doesn't work so removed.
Installed powerhouse aerator on lake side of Pittsburgh Bay, after trash pump opened hole.
Installed Fresh-flo aerator in front of hatchery cabin.
Rigged gas cans to trash pumps for 13 hour service.
Maintenance on compressor and trash pumps.

March 27 Put trash pump east of crew's cabin to open hole for aerator.
Installed two Fresh-f to aerators between cabin and ladder.
Sorted and spawned cutthroat.
Electrician wired Wild Rose and crew's cabin for aerators.
Installed two large stirrer aerators from Region 5 at Wild Rose.
Pittsburgh Bay completely opened by aerators, moved to outside.
Blower and Fresh-flo left in bay for fish.
Picked up dead fish in front of cabin (1,000) and hauled to landfill.
Maintenance on compressor and trash pumps.

March 28 Barber, Herron, George, Elle, Gamblin and Engemann picked up 1,800 dead fish in front of crew's cabin and Pittsburgh bay after ice is opened.
Sorted cutthroat for spawning.
Maintenance on Blackfoot compressor and trash pumps.
Elle and George took DO's as listed below:

Targhee Springs Slough = 4.1
Targhee Creek, in lake = 6.7
Howard Creek = 7.1, saw one live fish, no dead.
Duck Creek itself = saturated at 10.1

R6DJ92

Appendix A. Continued.

March 29 Maintenance on compressor and trash pumps.
Sorted and spawned cutthroat.
Herron, Barber and Engemann pack and return home.
Picked up 600 dead fish in front of cabin and hauled.

*As of March 29, hatchery personnel from Eagle, Clearwater, Sawtooth, Grace, Mackay, American Falls, Ashton and Henrys Lake had spent 599 hours on the lake-saving project and 21 different aeration units were installed. Hagerman Hatchery sent supplies.

March 30 Maintenance on compressor at Staley Springs.
Sorted cutthroat in spawnhouse.

March 31 Maintenance on compressor.
Introduce two helpers from Grace (John Lord and John Schmidt) to spawning at Henrys Lake.
Sorted cutthroat in spawnhouse.

April 1 Sort and spawn cutthroat
Maintenance on compressor.

April 2 Sort cutthroat.
Maintenance on compressor at Staley Springs.

April 3 Permanent personnel attend physical fitness testing.
Sort cutthroat.
Maintenance on compressor.
Removed compressor from Staley Springs, city wants returned.

April 4 Sorted and spawned cutthroat.
Maintenance on equipment.

April 5 Sorted cutthroat.
Picked up 800 more dead fish in front of hatchery.
Maintenance on aerators.
Repaired and moved stirrer agitator at Wild Rose.

April 6 Sorted cutthroat.
Hauled dead fish to landfill.
Looked around lake for open water and aerator locations.
Shocked and picked eggs.

R6DJ92

Appendix A. Continued.

April 7	Sorted cutthroat. Picked eggs for shipment.
April 8	Sorted cutthroat. Shipped eggs to Mackay. Maintenance on aerators.

*March 13, all three aerators working at 7:30 a.m.. At 8:00, Russ noticed lights out in spawnhouse while sorting fish. Chapman arrived at 9:30 and noticed fish dead near aerators and aerators not running. Plugs were pulled immediately, and crews instructed to stay out of the water around the ladder. Electrician was contacted immediately.

Electrician found that ground wire connection clamp had worked loose from the ground rod under the snow, so no ground existed. The fish were fine all night because special breakers were installed at the fish ladder outlets and a neutral line acted as the ground during the night of March 12. (A 3 prong plug has positive, neutral and ground.) However, in a freak accident around 8:00 a.m., the neutral wire leading to the outlets somehow broke, and the positive line remained connected, sending 200 volts positive current into the lake through the aerators, with the lake acting as the ground. The breakers didn't work to kick off the power because the ground wire was not connected, and consequently 150-200 fish were killed between 8:00 and 9:30 a.m. The problem was fixed, and sorting, spawning and aerator installation continued.

R6DJ92

Appendix B. Dissolved oxygen field results from Henrys Lake during March 1990 and 1991. Data collected by Byron White, Henrys Lake Foundation.

The Henrys Lake Foundation (HLF) has recorded the dissolved oxygen (DO) levels at various sites on Henrys Lake during the winters of 190 and 1991. This was done to assist the Idaho Department of Fish and Game (IDFG) personnel in identifying the effects of possible nutrient loading that might be occurring at different locations around the lake. The HLF monitored the DO levels during the month of March in both 1990 and 1991. The following report gives the results from each year and a comparison between the two surveys.

The instrument used by the HLF personnel was a HSI Model 57 DO meter connected to a YSI 5739 DO probe with a stirring boot. The equipment was calibrated according to the manufacturer's instructions prior to each field survey. The DO levels were measured starting just under the ice and every 015 meter to the lake bottom. The HLF personnel involved with the DO measurements were Bill Schiess and Byron White.

Several sites of interest were added to the 1991 survey while others were dropped because of time restraints. The sites monitored again from 1990 were relocated by using sets of landmarks for triangulation. I believe I need to better correlate the selection of monitoring sites with IDFG officials to make sure the survey is of benefit. Site selection should probably be reevaluated in regard to the development of depleted DO levels in the lake.

Author:

Byron White
Henrys Lake Foundation

R6DJ92

Comparison of HLF Surveys

The DO levels in Table 1 were recorded just under the ice at each monitoring site. Prior to the 1991 field survey the IDFG had already begun efforts to raise the DO levels at some monitoring sites. Staley Springs was not monitored due to concerns for personal safety on the ice. During 1990 the average thickness of the ice was approximately 3.0 to 3.5 feet thick compared to 1991 of 3.5 to 4.0 feet.

Table 1

Location	1990	1991
Duck Creek (50 yards East)	NM[a]	6.20[b]
Glory Hole (Staley Springs)	5.70	NM
Goose Bay (Outlet)	6.10	1.60
Hatchery Creek	NM	5.20*
IDFG Cabins	4.10	4.60*
Kenney Creek (Cliffs)	4.85	NM
Pintail Point	6.50	0.81
Pittsburg Creek (harbor mouth)	6.20	3.05*
Staley Springs	7.85	NM
Targhee Creek (mouth)	NM	7.30
Targhee Creek (1/2 mile west)	NM	1.80
Wild Rose Bay (west of	NM	1.10
Wild Rose Creek (mouth)	NM	0.25
Wild Rose Hybrid Hole	6.20	3.05

NM[a] = Not monitored
[b] = units are mg/1 (ppm)
* = DO levels have been raised by IDFG efforts

If there are any other questions or concerns that I might be able to help answer, please let me know. My phone is area code (208) 365-4858. I hope this information is helpful in proving supporting data to the IDFG.

B. M. White

Appendix B. Continued

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: Goose Bay

Description of location: The monitoring site was the center of the channel in the outlet at Goose Bay.

Site conditions: No IDFG activities are in close proximity to the site location.

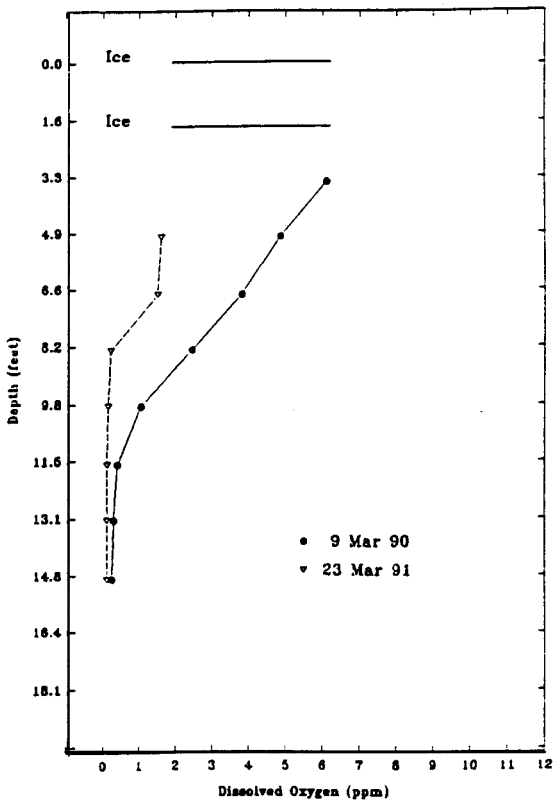
Comparison Table

Depth	1990	1991
Surface	Ice	Ice
1.6[a]	Ice	Ice
3.3	6.10[b]	Ice
4.9	4.85	1.60
6.6	3.80	1.50
8.2	2.45	0.22
9.8	1.05	0.15
11.5	0.40	0.12
14.8	0.30	0.11
16.4	0.25	0.11

[a] = The units for the depth are given in feet.

[b] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:
1) Comparable DO levels at Pintail Point and the location 1/2 mile west of Targhee Creek.

Appendix B. Continued

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: IDFG Cabins

Description of location: The monitoring site was just off of the IDFG buildings that are east of Hatchery Creek. The site location was moved in closer to the shoreline for 1991. This was done to record the effects of the IDFG efforts to raise the DO levels.

Site conditions: Prior to the 1991 monitoring date the IDFG had started the use of aerators at Hatchery Creek and the pumping of water on the ice at the shoreline in front of the cabins.

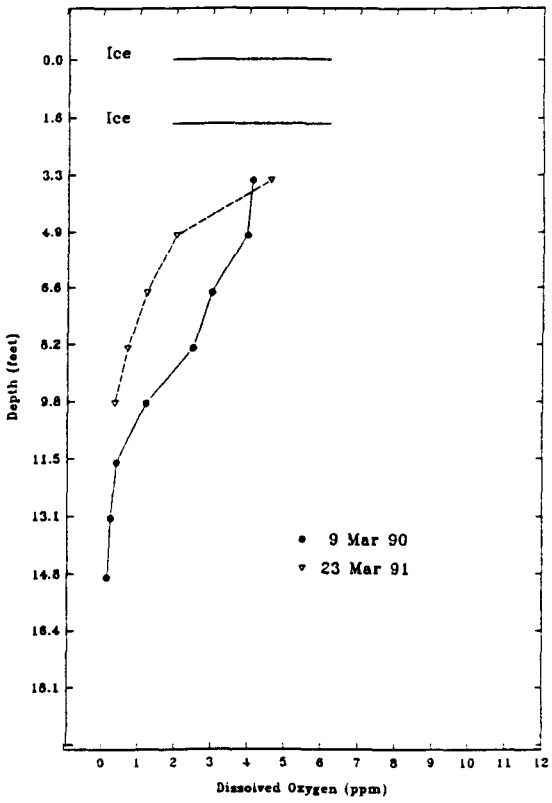
Comparison Table

Depth	1990	1991
Surface	Ice	Ice
1.6[a]	Ice	Ice
3.3	4.10[b]	4.60
4.9	3.95	2.02
6.6	3.00	1.23
8.2	2.50	0.71
9.8	1.20	0.35
11.5	0.40	
14.8	0.25	
16.4	0.15	

[a] = The units for the depth are given in feet.

[b] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:
1) The difference in the depth of the lake is from relocation of the site and the lower lake level.

Appendix B. Continued

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: Pintail Point

Description of location: The monitoring site is east of Pintail Point approximately 300 yards and 400 yards off of the north shoreline.

Site conditions: No IDFG efforts are in close proximity to the monitoring site.

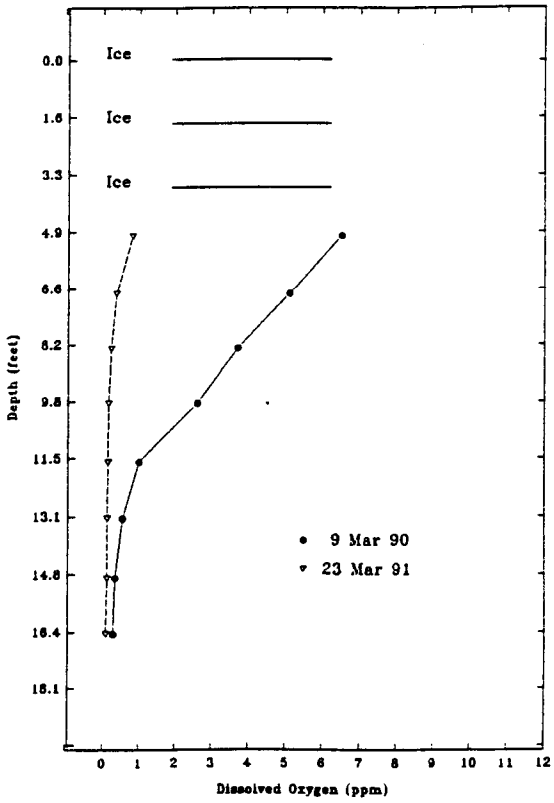
Comparison Table

Depth	1990	1991
Surface	Ice	Ice
1.6[a]	Ice	Ice
3.3	Ice	Ice
4.9	6.50[b]	0.81
6.6	5.10	0.37
8.2	3.70	0.23
9.8	2.60	0.16
11.5	1.00	0.15
14.8	0.55	0.13
16.4	0.35	0.12
18.1	0.30	0.10

[a] = The units for the depth are given in feet.

[b] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:
1) Comparable DO levels at Goose Bay and the location 1/2 mile west of Targhee Creek.

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: Pittsburg Creek

Description of location: Pittsburg Creek flows into Spike's Harbor and the monitoring site was just off the mouth of the harbor. The site location was moved in closer to the harbor mouth for 1991. This was done to record the effects of the IDFG efforts to raise the DO levels.

Site conditions: IDFG had started the use of an aerator and the pumping of water onto the ice in the harbor prior to the monitoring date.

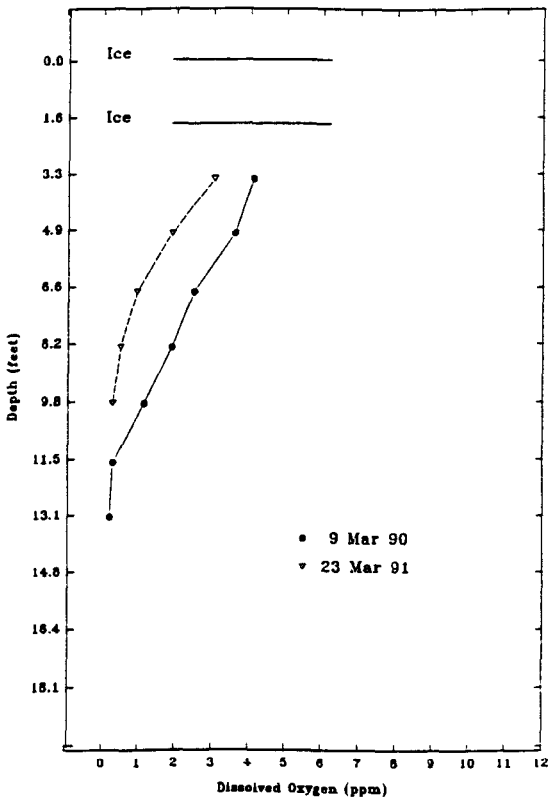
Comparison Table

Depth	1990	1991
Surface	Ice	Ice
1.6[a]	Ice	Ice
3.3	4.10[b]	3.05
4.9	3.60	1.90
6.6	2.50	0.95
8.2	1.90	0.50
9.8	1.15	0.29
11.5	0.30	
14.8	0.20	
16.4	0.15	

[a] = The units for the depth are given in feet.

[b] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:

1) The difference in the depth of the lake is from relocation of the site and the lower lake level.

2) Compare the DO levels at this creek mouth to those at Targhee, Duck, and Wild Rose.

Appendix B. Continued

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: West of Targhee Creek

Description of location: The monitoring site is off the mouth of Targhee Creek approximately 1/2 mile west.

Site conditions: No IDFG efforts are in close proximity to the monitoring site.

Comparison Table

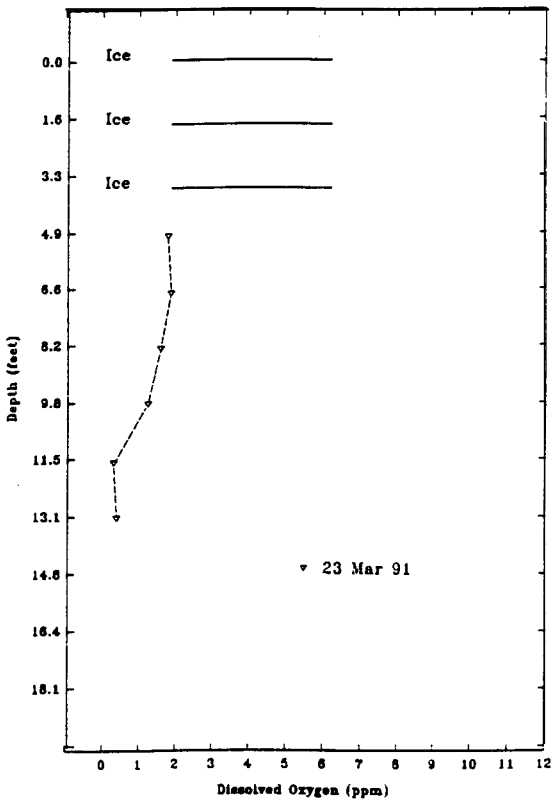
Depth	1990	1991
Surface	Ice	Ice
1.6[a]	NM[b]	Ice
3.3	NM	Ice
4.9	NM	1.80[c]
6.6	NM	1.88
8.2	NM	1.60
9.8	NM	1.25
11.5	NM	0.32
14.8	NM	0.40

[a] = The units for the depth are given in feet.

NM[b] = Not monitored.

[c] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:
1) Comparable DO levels at Goose Bay and Pintail Point.

Appendix B. Continued

DISSOLVED OXYGEN FIELD RESULTS

Lake: Henry's Lake

Site: Wild Rose Hybrid Hole

Description of location: The monitoring site is known to fisherman as the Wild Rose Hybrid Hole. This site is approximately 1 mile south of the Wild Rose Ranch Resort and 1.75 miles east of Staley Springs Resort.

Site conditions: No IDFG activities in close proximity to the site location.

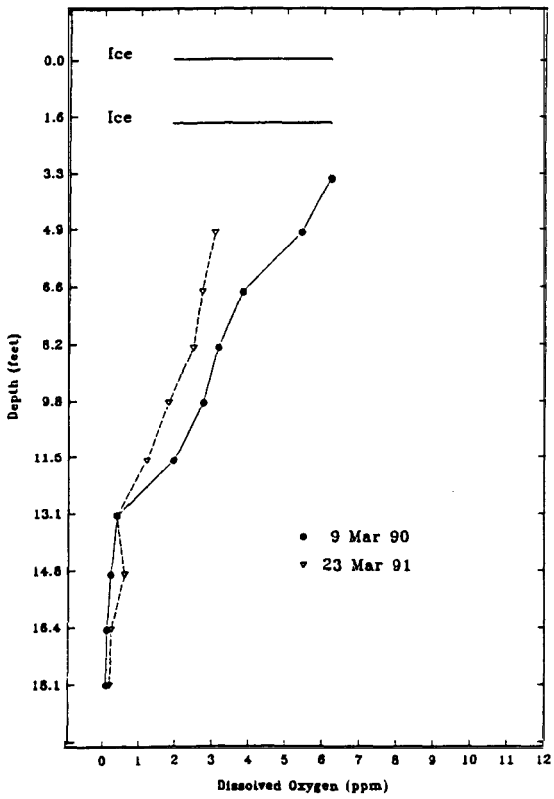
Comparison Table

Depth	1990	1991
Surface	Ice	Ice
1.6[a]	Ice	Ice
3.3	6.20[b]	Ice
4.9	5.40	3.05
6.6	3.15	2.70
8.2	2.75	2.47
9.8	1.95	1.80
11.5	0.40	1.20
14.8	0.23	0.40
16.4	0.12	0.60
18.1	0.10	0.25

[a] = The units for the depth are given in feet.

[b] = The units for DO are given in mg/l (ppm).

Dissolved Oxygen Profile



Notes:

1) It is believed that there are springs in the lake in the vicinity of the monitoring site.

JOB PERFORMANCE REPORT

Name: Regional Fishery Management Investiaations

State of: Idaho

Title: Region 6 Rivers and Streams Investigations

Project No: F-71-R-16

Job No: 6-c

Period Covered: July 1, 1991 to June 30, 1992

ABSTRACT

For the second year, population estimates for the South Fork Snake River indicated better survival of age 1+ cutthroat trout Oncorhynchus clarki and brown trout Salmo trutta. The increased survival coincides with increases of winter flow releases from Palisades Dam from 20.7 cms during 1987-88 and 1988-89 to 30.8 cros in 1989-90 and 1990-91. We believe the increased flows provide greater habitat for age 0 trout throughout the winter. Densities of age 3+ and older cutthroat declined in the Palisades and Conant Valley section due to poor survival of 1987 and 1988 year classes with low winter flows. Populations of all cutthroat age classes increased in the Twin Bridges and Lorenzo sections due to increased winter flows and restricted regulations beginning in 1990.

Henrys Fork rainbow trout O. mykiss populations sampled in 1991 indicated declines in Box Canyon and Ora Bridge sections and remained unchanged in the Pinehaven section compared with prior years. Low winter flows have reduced overwinter survival of young trout despite catch-and-release regulations in the Box Canyon and Pinehaven sections since 1988. The Ora Bridge section estimate was impacted by dewatering in March 1991, related to Ashton hydropower project flow manipulations.

Big Lost River population estimates in the section near the Idaho Department of Fish and Game access showed a 32% decline in rainbow trout numbers compared to 1987, although all age classes were well represented. We conducted an estimate in a new sample section near Leslie in 1991. This section had lower densities of rainbow compared with the upper section. Low winter flow releases below Mackay Dam probably result in lower overwinter survival the further downstream from the dam, as bed loss and icing affect open water conditions in winter.

Population estimates in Antelope, Cherry, and Alder creeks indicate very low densities of wild rainbow and brook trout Salvelinus fontinalis. Angler reports indicate the reduction of trout populations in small Big Lost River tributaries is widespread. Natural flows have fallen to all time lows in the fifth straight year of drought conditions in the Lost River area. Low flows promote temperature extremes during both summer and winter.

Reward tags were used to evaluate return-to-the-creel for hatchery put-and-take rainbow trout released in Big Lost River, Antelope Creek, and Iron Bog Creek. Returns-to-the-creel were 22% in the Big Lost River, 20% in Antelope Creek, and 22% in Iron Bog Creek. Few fish survived overwinter to be caught in the 1992 fishing season.

Authors:

Steve Elle
Regional Fishery Manager

Mark Gamblin
Regional Fishery Biologist

Jim Tharp
Fisheries Technician

R6DJ92

OBJECTIVES

1. To continue monitoring South Fork Snake River fishery in response to winter flow reductions and special regulations to assess fishery status and trend. Evaluate recruitment changes due to variable winter flow releases from Palisades Dam. Use data to support instream flow research recommendations for winter minimum flows.

2. To determine status of brown trout Salmo trutta populations below Palisades Dam following the removal of the small no fishing sanctuary in January 1988.

3. To reevaluate Henrys Fork trout populations from Island Park Reservoir to Riverside Campground in response to catch-and-release regulations implemented in 1988 and drought conditions resulting in low winter flows.

4. To evaluate Henrys Forks trout populations from Ashton Dam to Fall River for long-term trend data and to assess impacts of winter 1990-91 flow reductions due to Ashton hydropower project operation.

5. To monitor trout population status in the Big Lost River below Mackay Reservoir. And to establish baseline population data in Alder and Antelope creeks.

6. To evaluate return-to-the-creel of hatchery rainbow trout released in lower Big Lost River, Antelope Creek, and Iron Bog Creek.

METHODS

South Fork Snake River

Trout populations in the South Fork Snake River were monitored using electrofishing and aerial redd surveys (brown trout). Using a jet boat with boom-mounted anodes, electrofishing was conducted on a 5.1-km long section near Palisades Creek, a 4.9-km long section in Conant Valley, a 2.9-km long section upstream of Twin Bridges, and a 4.8-km long section at Lorenzo (Figure 1). All population estimates were made using the Peterson method (Lackey and Hubert 1977), with two days spent marking fish and one day completing the recapture run. Estimates were made for size groups based on sampling efficiency. We allowed a one-week interval between marking and recapture runs. We sampled Palisades, Twin Bridges, and Lorenzo sections in September. Conant Valley was sampled in October.

The annual brown trout spawning survey was conducted December 9, using a fixed-wing aircraft. Counts were made flying downstream from Palisades Dam to the confluence with the Henrys Fork as in previous years (Elle et al. 1987).

R6DJ92

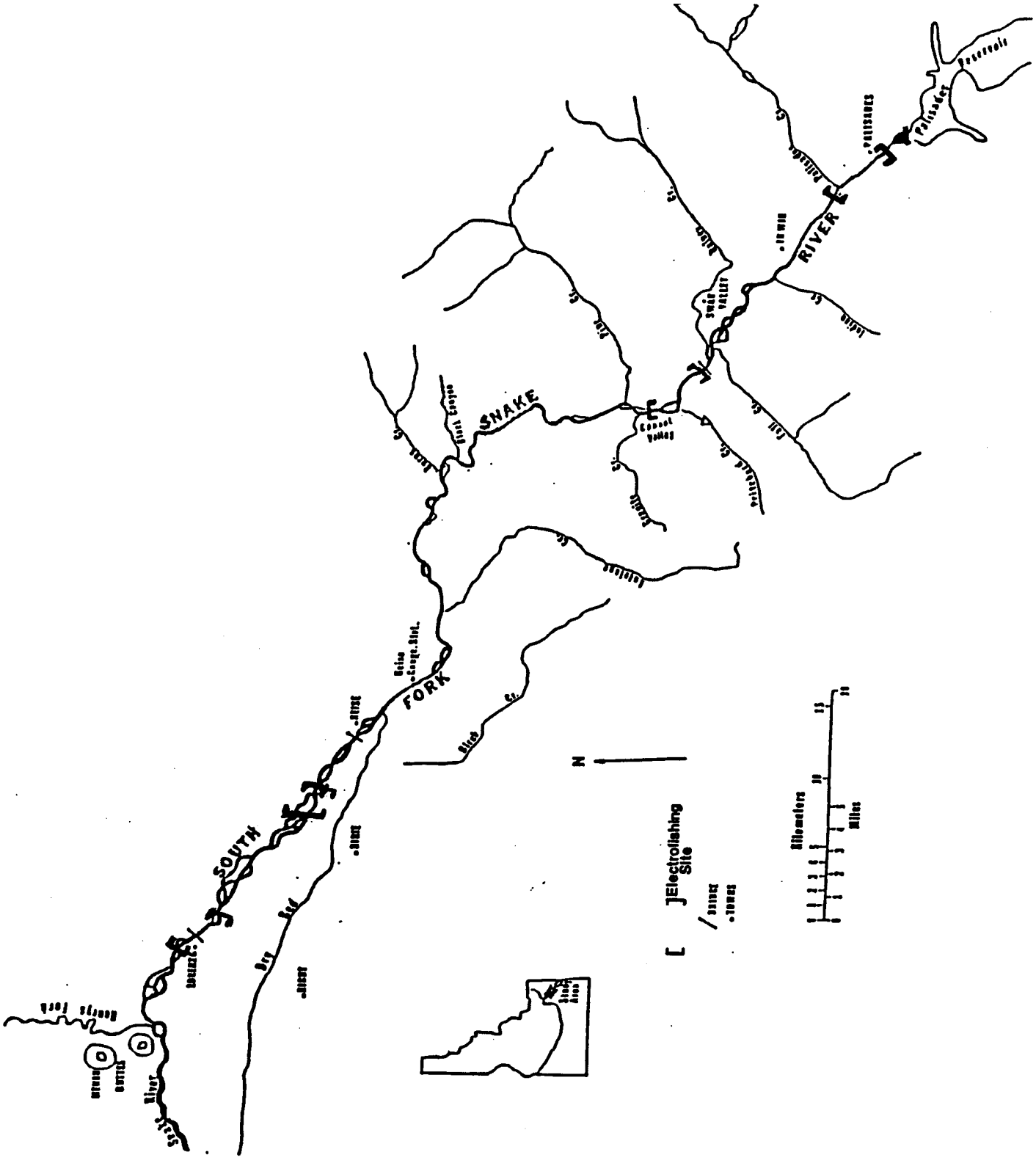


Figure 1. Map of South Fork Snake River showing electrofishing index areas.

Henrys Fork

Population sampling was conducted at three sites on the Henrys Fork: Island Park Dam to Last Chance, Pinehaven to Riverside and Ora Bridge to Seeleys (Figure 2). Population estimates were made using the same methodology described for the South Fork Snake River, except we used two drift boats with boom-mounted anodes in place of a jet boat used in the South Fork. Estimates were made for size groups based on sampling efficiency. We sampled the Box Canyon section in May, the Pinehaven section in August, and the Ora section in September.

Big Lost River

Population Sampling

Population estimates were conducted on the Big Lost River below Mackay Dam at two sites: near the Idaho Department of Fish and Game (IDFG) access (Mackay reach) and upstream from Leslie. We used a canoe with two throwable anodes to collect fish. We used the Peterson method for population estimates, with one day to mark fish and one day to recapture fish. We allowed a one-week interval between marking and recapture runs. Estimates were conducted during August.

Population estimates were completed in Alder, Antelope, Iron, and Cherry creeks to provide baseline fisheries data. Estimates were made using a Cofelt backpack shocker to collect fish. We used two-pass (Seber and LeCreu 1967) removal methodology or Peterson method to complete population estimates.

Evaluation of Hatchery Trout Releases

We used reward tags to evaluate return-to-the-creel of hatchery rainbow trout released in Big Lost River, Antelope Creek, and Iron Bog Creek. Numbered size 8 monel metal jaw tags were used to mark individual trout. We released 200 tagged trout in the Big Lost River, 150 tagged trout in Antelope Creek, and 100 tagged trout in Iron Bog Creek. Signs notifying anglers about the reward tag program and where to report the tag information were posted throughout the area of hatchery fish releases. Baseball caps were given to anglers as rewards.

R6DJ92

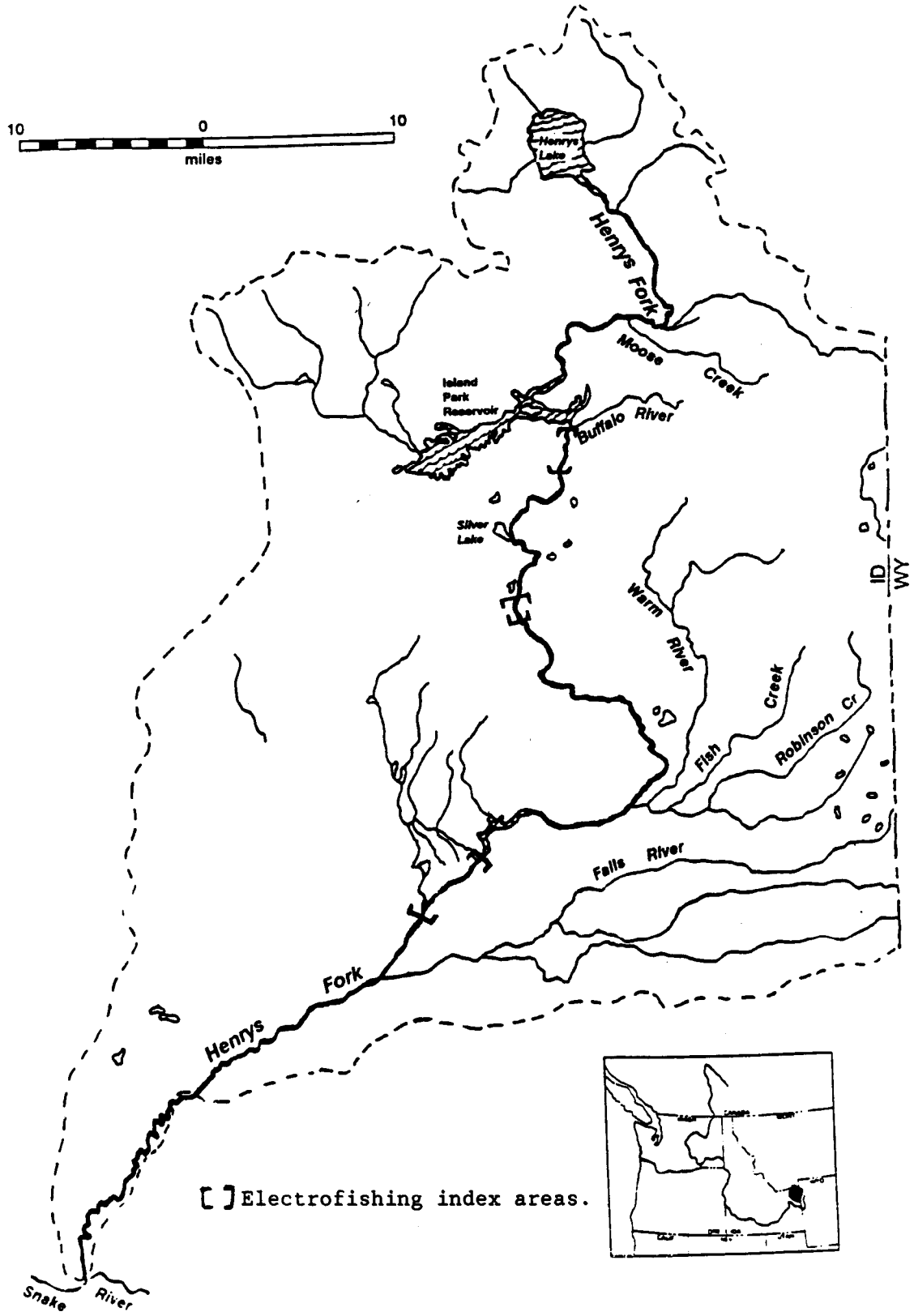


Figure 2. Map of Henrys Fork showing electrofishing index areas.

RESULTS

South Fork Snake River

Electrofishing

Palisades Creek-A total of 952 trout were captured at least once during three days of electrofishing Sheep Creek to Palisades Creek. Species composition for trout included wild cutthroat Oncorhynchus clarki (65%), wild rainbow trout O. mykiss, and hybrids (22%), hatchery cutthroat (10%), and brown trout (6%). Wild cutthroat showed a decrease in species composition compared to 1989 (Table 1). The increase in hatchery cutthroat is largely due to flushing from Palisades Reservoir during a record drawdown in 1990. The increase in wild rainbows and hybrids raises concern about dilution of the cutthroat gene pool. We will follow this component of the population in future years.

Densities of age 1 and older cutthroat trout (fish larger than 150 mm) decreased in 1991 versus 1989 due to fewer age 3 and older fish present in the population (Table 2). Densities of brown trout for the Palisades section remain low (2.8 fish/hectare), with few older fish captured (Figure 3).

Length-frequency data indicate good representation of all year classes for wild cutthroat, especially age 1+ and age 2+ fish (Figure 4). Brown trout length-frequencies indicate the presence of age 1+ fish but few older individuals (Figure 5).

The whitefish estimate was 6,527 (C.I. = 4082-11092) with a density of 161/hectare for 1991.

Conant Valley-A total of 2,086 trout were captured at least once during three days of electrofishing at Conant Valley. Species composition was 80% wild cutthroat trout, 12% brown trout, and 7% rainbow and hybrid trout combined (Table 1). The species composition shifted slightly to more brown trout in 1991, with rainbow and hybrid trout remaining similar to the past two years.

Total densities of wild cutthroat at Conant Valley declined for the first year since 1987 (Table 2). The major decline occurred in cutthroat age 3+ and older. We believe this reflects a combination of harvest as fish exceed 408 mm (16 inches) and the lack of recruitment from 1987 and 1988 years classes. During 1991, we observed higher densities of age 2+ cutthroat compared to prior years. Survival of this group (1989 year class) has been enhanced by higher flows the past two winters. Flow releases from Palisades Dam were approximately 30.8 cms in 1989-90 and 1990-91. We believe the lower density of age 1+ fish in 1991 versus 1990 reflects more severe winter icing conditions which occurred during the winter of 1990-91. Brown trout densities for the Conant section declined in 1991 versus 1990 (Figure 3).

R6DJ92

Table 1. Species composition for trout captured in electrofishing sections of the South Fork Snake River, 1986 through 1991.

Location	Yea	Species Composition[a]			
		WCT	BRN	WRB+HYB	HC
Palisades	1989	81	8	9	2
	1991	61	6	22	10
Conant Valley	1986	84	14	3	--
	1988	88	9	3	--
	1989	90	3	7	--
	1990	86	8	6	--
	1991	80	12	7	--
Twin Bridges	1989	50	50	--	--
	1991	55	45	--	--
Lorenzo	1987	39	61	--	--
	1988	34	63	--	--
	1989	25	75	--	--
	1990	39	61	--	--
	1991	37	63	--	--

[a] WCT = wild cutthroat trout
BRN = brown trout
WRB = wild rainbow trout
HYB = hybrid
HCT = hatchery cutthroat trout

TABLES

Table 2. Densities of wild cutthroat trout (fish/hectare) for South Fork Snake River electrofishing index areas 1989, 1990, and 1991.

Sample section	Age	Year 1989	1990	1991
Palisades	1+	NE	--	8
	2+	4	--	23
	≥3+	39	--	19
	All ≥1+	73[a]	--	41
Conant Valley	1+	33	181	99
	2+	16	24	41
	≥3+	170	120	70
	All ≥1+	215	240	150
Twin Bridges	1+	NE	--	234
	2+	NE	--	79
	≥3+	42	--	28
	All ≥1+	81[b]	--	317
Lorenzo	1+	NE	NE	25
	≥2+	19	26	60
	≥3+[a]	14	15	17
	All ≥1+	33[b]	78[b]	89

[a] Numbers included in age group >2+.
[b] Estimate biased because of not enough marks recaptured on younger age classes.

TABLES

SOUTH FORK SNAKE RIVER

Age 1+ and Older Brown Trout

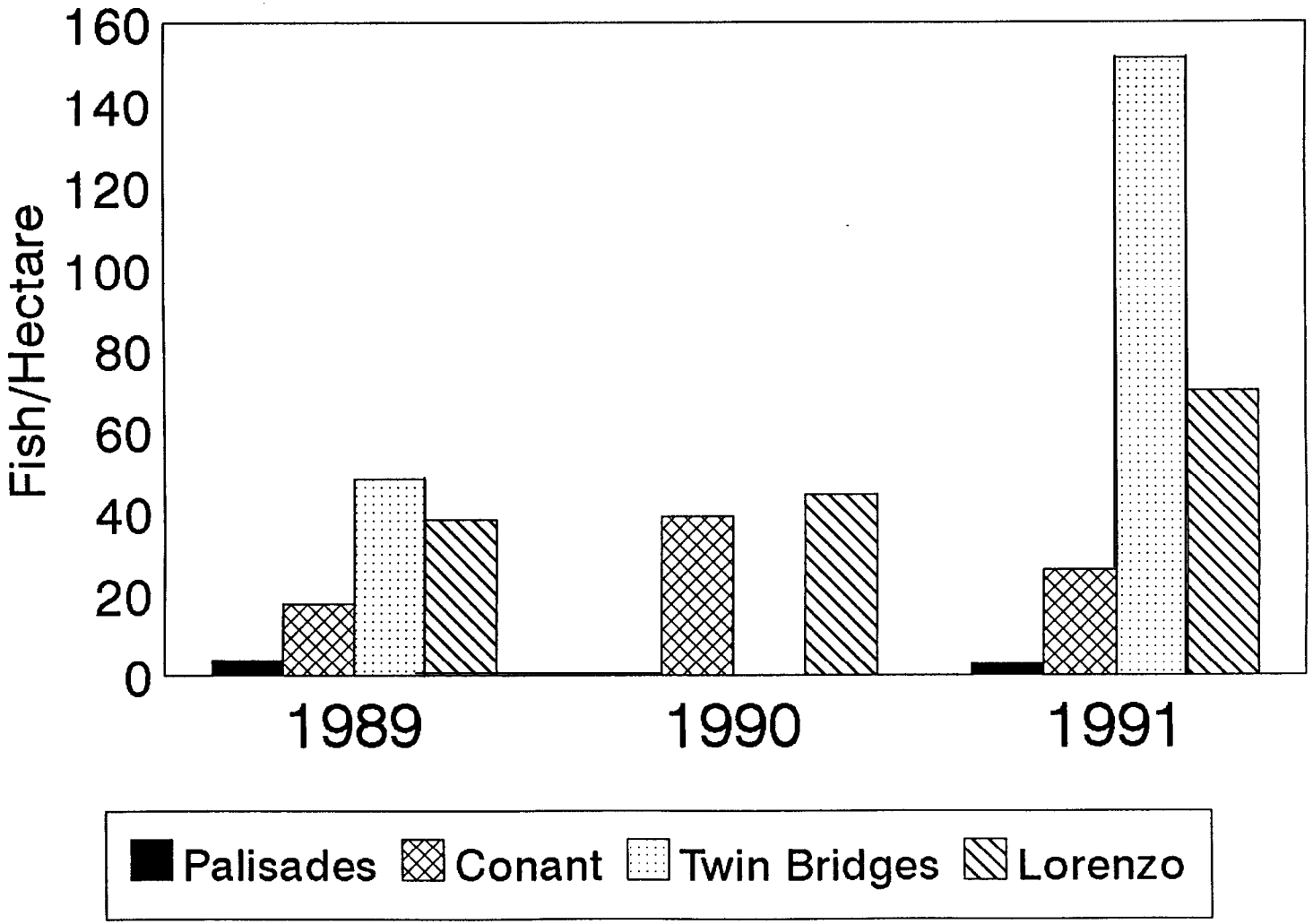


Figure 3. Densities of age 1 and older brown trout in the South Fork Snake River electrofishing sections, 1989 through 1991.

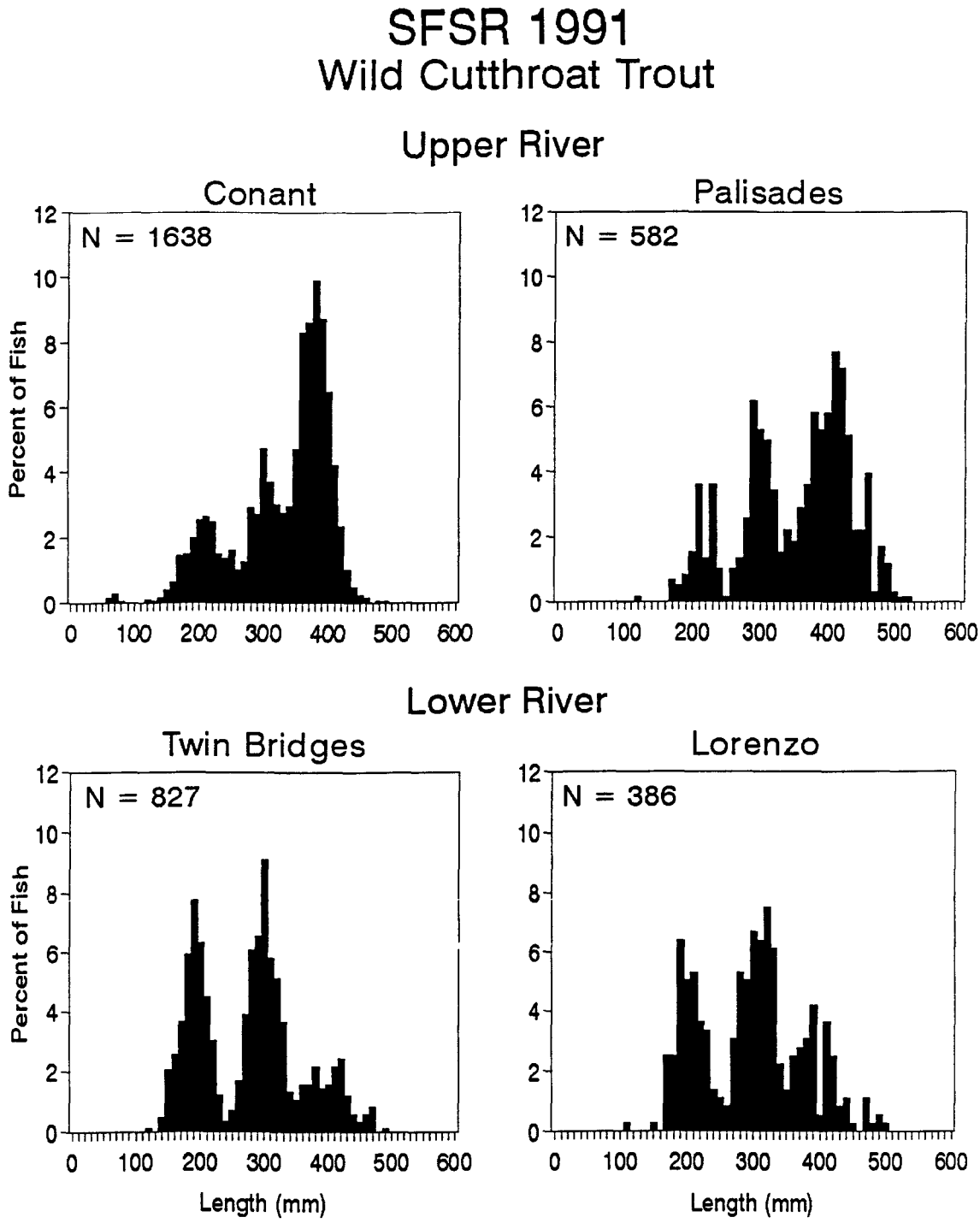


Figure 4. Length-frequencies distributions for cutthroat trout collected by electrofishing in South Fork Snake River sample sections fall 1991.

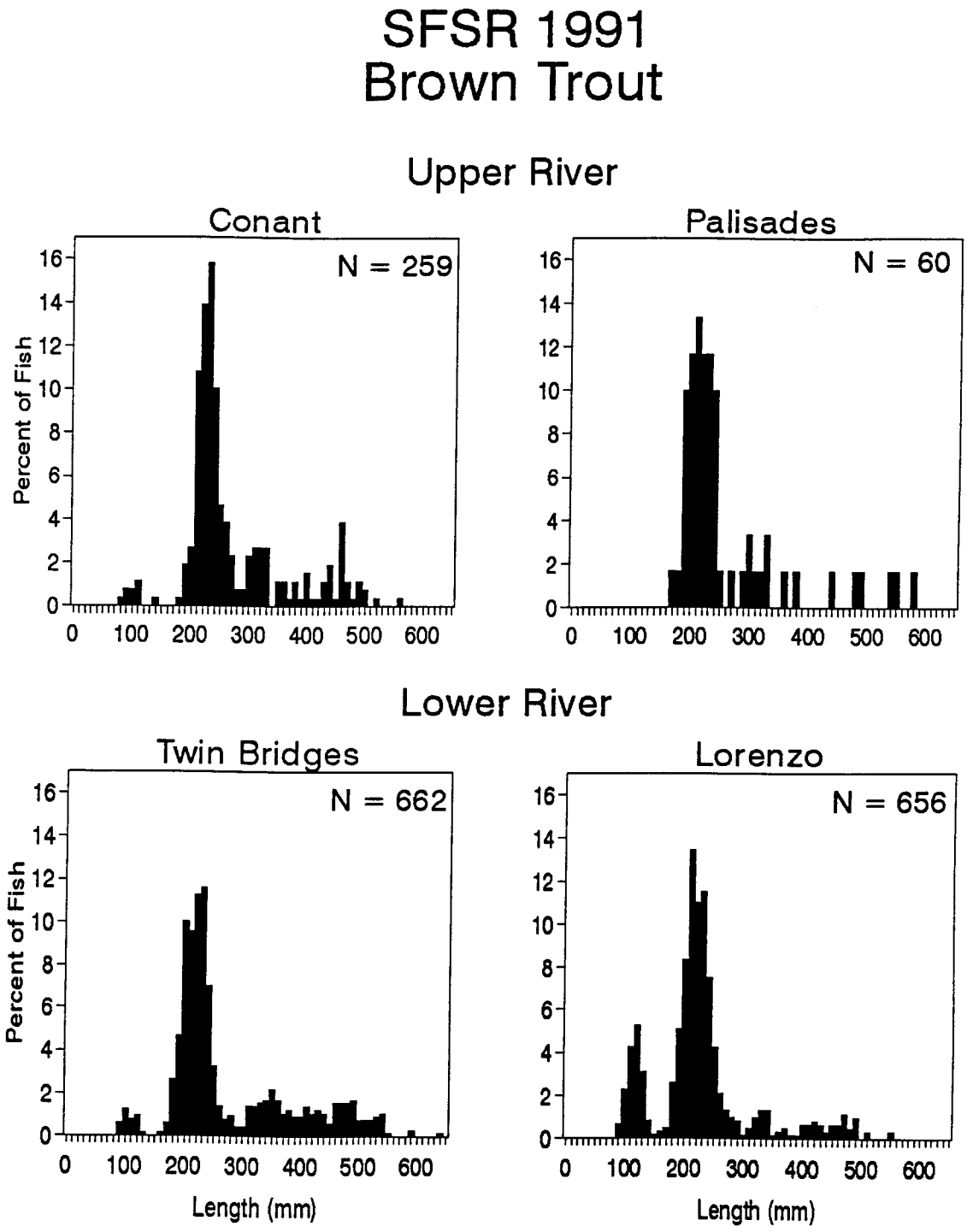


Figure 5. Length-frequency distributions for brown trout collected by electrofishing in South Fork Snake River sample sections fall 1991.

Length-frequency data show the declining percentage of large cutthroat with stronger age 1+ and age 2+ cutthroat (Figure 6). Brown trout length frequencies show the same trend. However, the strong 1989 year class present in 1990 sampling is not evident in 1991 (Figure 7).

Twin Bridges-Species composition in 1991 has shifted toward cutthroat compared to 1989 sampling (Table 1). Densities of cutthroat have increased from 81 fish/hectare in 1989 to 317 fish/hectare in 1991 (Table 2). Brown trout densities also increased dramatically since 1989 in the Twin Bridges section (Figure 3). Increased winter flows coupled with new harvest restrictions on cutthroat beginning in 1990 have greatly improved these populations.

The Twin Bridges sample section is representative of the improved brown trout habitat of the South Fork below Heise Bridge. Multiple channels and woody debris support higher numbers of all sizes of brown trout versus Conant Valley or Palisades sections (Figure 5). As in all sections, the length-frequency dramatically shows a strong 1989 year class (age 1+ fish).

Lorenzo-Species composition, based on fish sampled, was 37% cutthroat trout and 63% brown trout (Table 1). These percentages have been fairly constant except for 1989. Densities of cutthroat trout have increased compared to 1989 and 1990 at Lorenzo (Table 2). The major increases in density have been age 1+ and age 2+ cutthroat trout. Brown trout densities also increased at Lorenzo (Figure 3).

Length-frequency data from cutthroat and brown trout (Figures 8 and 9) show similar patterns of age class strength compared with upriver sections. Although cutthroat densities increased in 1991 at Lorenzo, the older age classes (age 3+ and older) are declining. The restricted cutthroat harvest regulation has protected younger cutthroat, but the poor survival of young fish in 1987-88 and 1988-89 is showing up in the population.

During the winters of 1987-88 and 1988-89, the South Fork flows dropped to 20.7 cuts (800 cfs) due to water storage constraints at Palisades Dam. Our electrofishing data showed poor recruitment of age 1+ trout the year following the low flows, indicating poor survival of age 0+ cutthroat and brown trout during the low flow winters. During the winters of 1989-90 and 1990-91, winter flows were maintained at 30.8 cuts (1,200 cfs). Population estimates in 1990 and 1991 show much higher numbers of age 1+ trout in the sample sections (Figures 6, 7, 8 and 9). Instream flow analysis during 1990 and 1991 indicates the minimum winter flow should be 38.6 cuts (1,500 cfs) or greater, with an optimum flow equal to historic winter natural flows (approximately 54 cuts or 2,100 cfs) (Bill Schrader, personal communication). Near shore habitat is reduced sharply below 30 cms.

The age 1+ (1990 year class) cutthroat sampled in 1991 is not as strong as the age 1+ cutthroat sampled in 1990 (Figures 6 and 8). Although winter flows below Palisades Dam were equal in 1989-90 and 1990-91, the South Fork had major icing conditions in 1990-91. Palisades Dam was drawn down to record low capacity

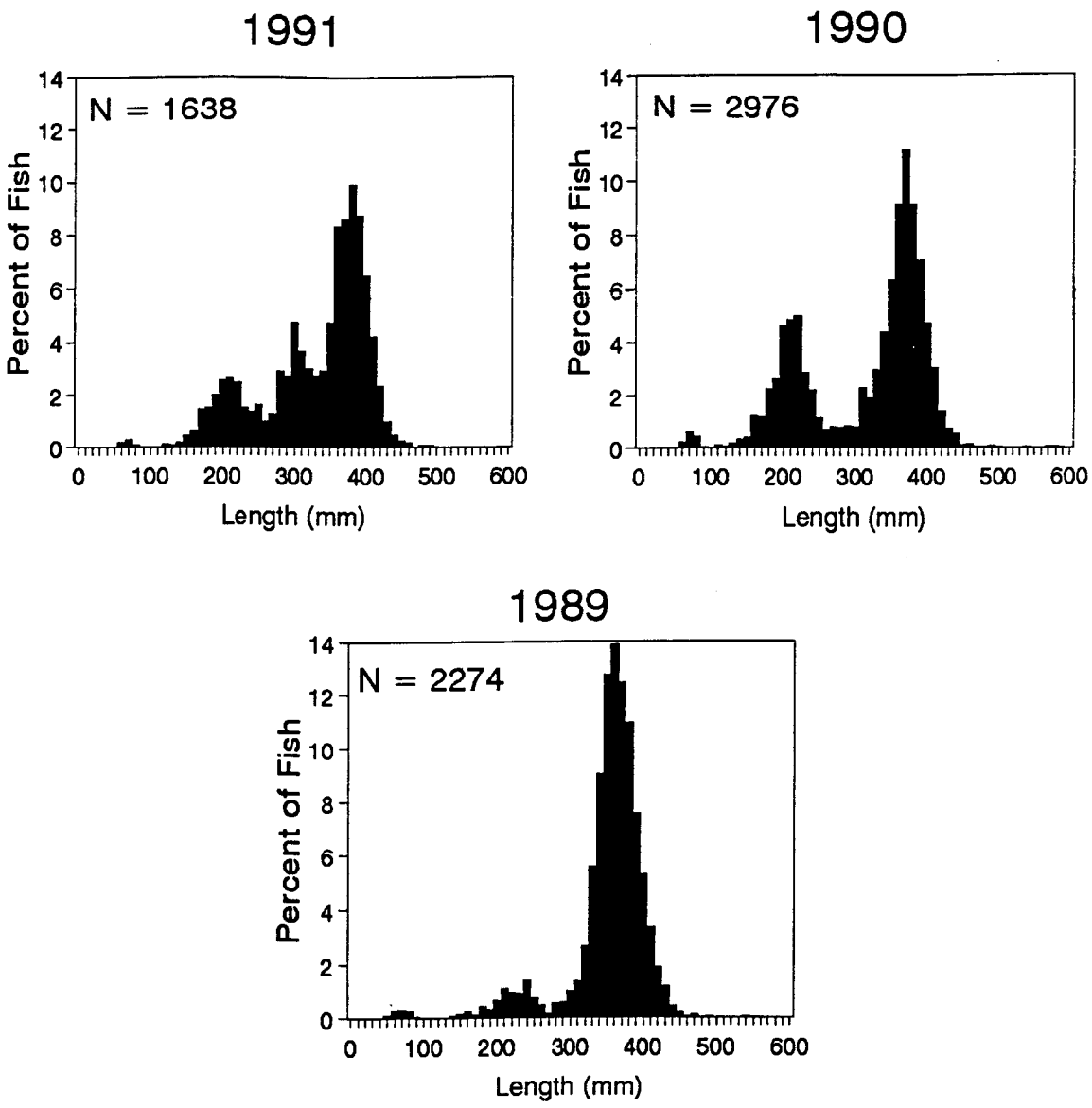


Figure 6. Length-frequency distributions for wild cutthroat trout collected in South Fork Snake River at Conant Valley, 1989 through 1991.

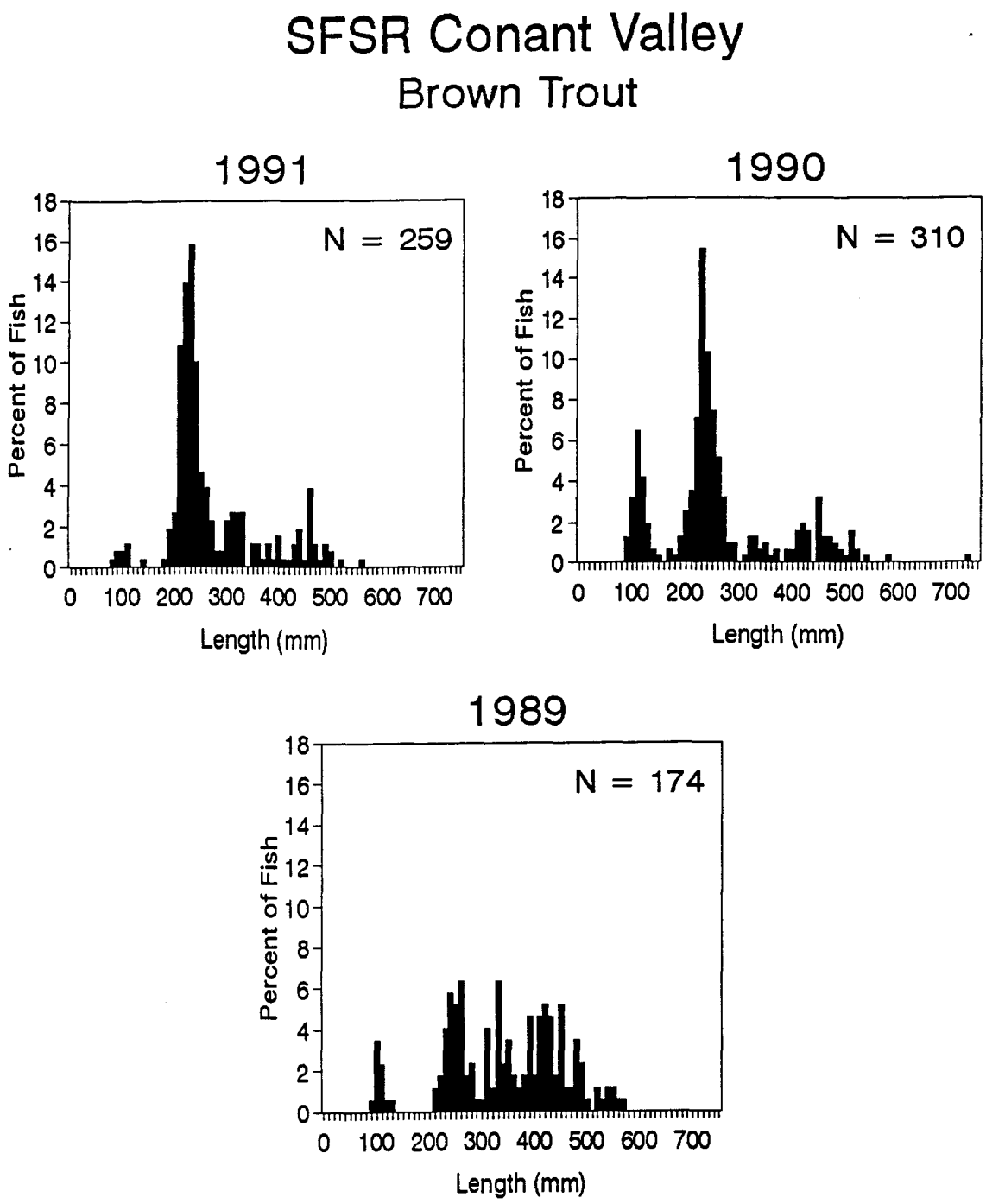


Figure 7. Length-frequency distributions for brown trout collected in South Fork Snake River at Conant Valley, 1989 through 1991.

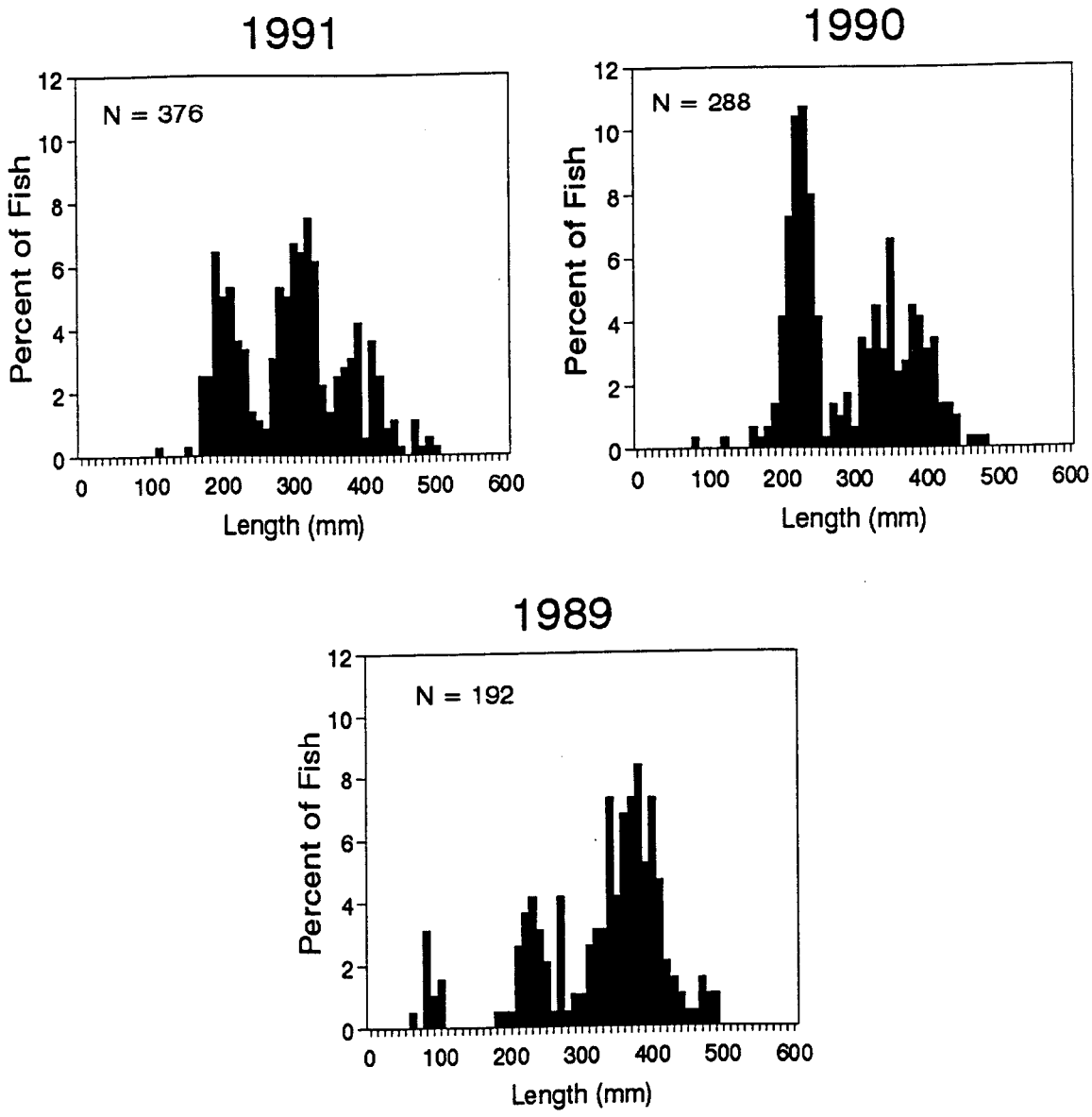


Figure 8. Length-frequency distributions for wild cutthroat trout collected in South Fork Snake River at Lorenzo, 1989 through 1991.

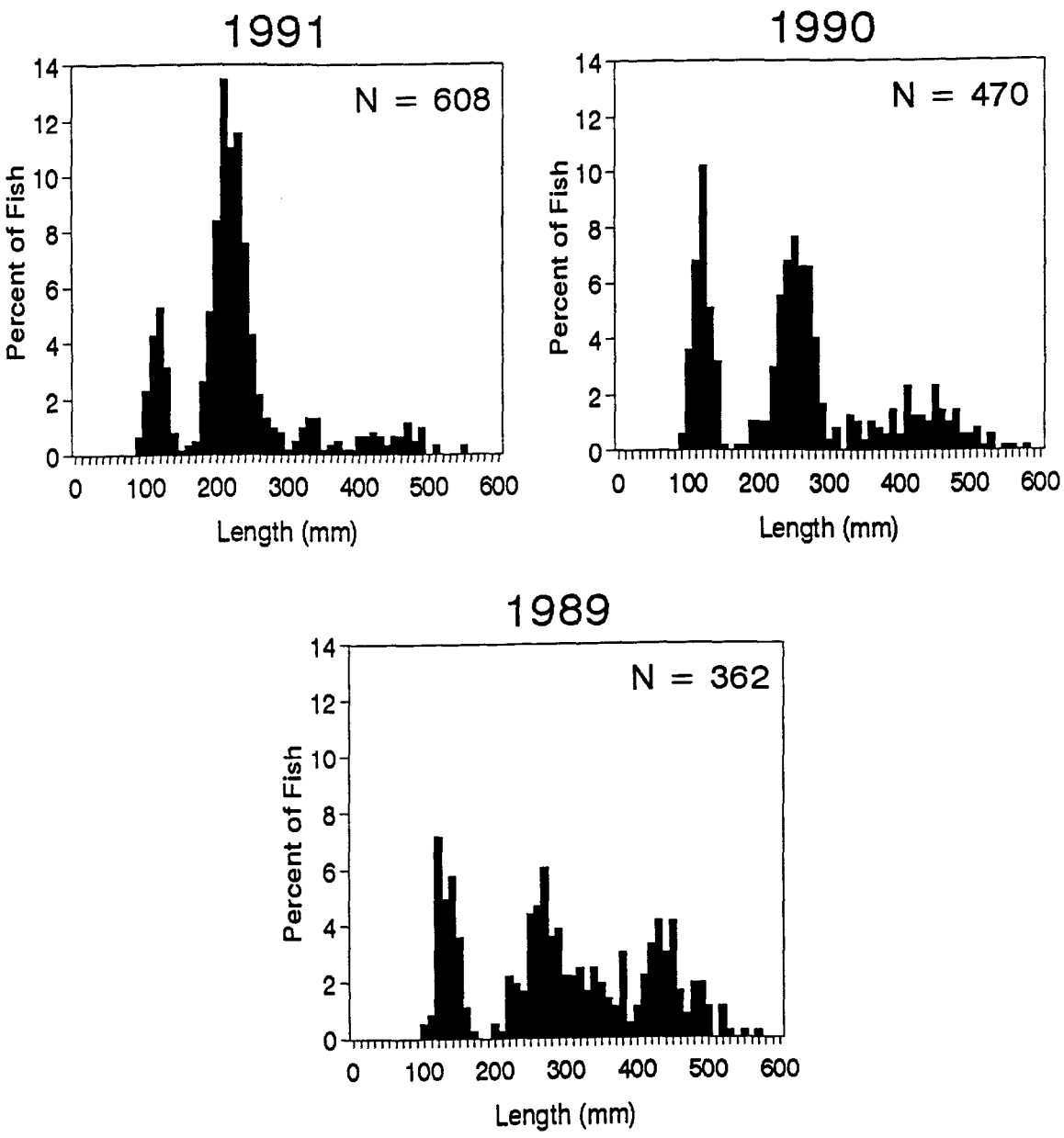


Figure 9. Length-frequency distributions for wild brown trout collected in South Fork Snake River at Lorenzo, 1989 through 1991.

in 1990, and the winter discharge from the dam was 1°C versus the typical 4°C. Discharge closer to the dam surface in 1990-91 produced colder downstream temperatures and icing occurred, whereas the river was mostly ice free in 1989-90.

Although densities of small trout have improved with high winter flows, the numbers of older fish have declined in the Conant and Palisades Creek sections (Table 2). We believe this reflects mortality from old age and fishing harvest to older fish, with little recruitment from fish of the 1987 and 1988 year classes which survived poorly in the low flow winters (1987-88 and 1988-89). This trend should begin to reverse in 1992 and 1993 as the 1989 year class become 350 to 400 mm size fish.

The increases in densities of fish in Twin Bridges and Lorenzo sections indicates not only improved survival with higher winter flows, but also harvest reductions due to regulation changes in January 1990. In 1990, fishing regulations below Heise were changed to two cutthroat, none between 8-16 inches, which has been the upstream regulation since 1984. We expect to see continued increases in trout populations (particularly cutthroat) in this area.

Brown Trout Spawning Survey

The 1991 brown trout redd count was 889, the highest counted to date (Table 3). Although redds counted in the afterbay were lower than 1990, our observations still indicate considerable superimposition of redds in this area. Higher redd counts were made in the Irwin to Conant section and Heise to the mouth section. Counting conditions in 1991 were very good. We flew an hour earlier (starting time 1100) and had overcast conditions which cut down on glare. As in past years, we conclude the 1988 opening of the tailrace area below Palisades Dam has not reduced the overall population of brown trout in the South Fork.

Henrys Fork

Box Canyon

Estimated densities of wild rainbow trout in the Box Canyon section of the Henrys Fork have continued to decline (Table 4; Figure 10). The densities of all trout over 150 mm were only 15% of the 1987 estimates and less than half the estimates for 1989. The range in size (Figure 11) has remained fairly consistent since 1987.

Since the winter of 1987-88, southern Idaho has had drought conditions. Requests for winter out flows from Island Park Reservoir are 5.1 cms (200 cfs) minimum and 7.7 cms (300 cfs) or more optimum flows. Since 1987-88, winter flows have frequently been reduced to 2.6 cms (100 cfs) below Island Park Dam. During

Table 3.Brown trout redd counts on the South Fork Snake River, 1982 to present.

Location	Distance (km)	12/8 1982	12/20 1983[a]	12/4 1984	12/10 1985	12/5 1986	12/4 1987[b]	12/5 1988	12/18 1989[c]	12/7 1990	12/9 1991
Afterbay of Palisades	0.8	90	49	75	179	294	70	199	117	168	111
Afterbay-Irwin	11.2	0	0	51	143	20	2	15	0	7	0
Irwin-Conant Valley	15.8	4	4	8	65	46	103	8	106	12	207
Conant-Burns Creek	16.2	120	96	37	143	311	133	216	215	171	216
Burns Creek-Anderson Diversion	20.6	57	9	51	8	62	47	39	61	127	141
Anderson-Heise Bridge	5.6	0	0	7	5	0	7	2	0	0	0
Heise Bridge-Mouth	30.4	NC	NC	23	65	67	168	66	75	81	214
Totals	100.6	271	158	252	608	809	530	545	574	564	889

TBLS

Table 4. Densities of wild rainbow trout (fish/hectare) for Henrys Fork electrofishing index areas between 1987 and 1991. Ninety-five percent confidence limits in parentheses.

Sample location	Age	Densities (fish/hectare) 1987	1988	1989	1991
Box Canyon	2+	102 (59-199)		23 (NA)	34 (20-68)
	≥3+	70 (50-104)		57 (38-93)	21 (17-27)
	All ≥150 mm	554 (423-747)		177 (132-246)	87 (73-125)
P1nehaven	2+	No Est.			73 (45-132)
	≥3+	No Est.			No Est.
	All ≥150 mm	356 (241-524)[a]			339 (NA)[a]
Ora Bridge	2+		237 (145-465)		16 (7-37)
	≥3+		65 (37-145)		33 (17-72)
	All ≥150 mm		592 (NA)		159 (101-272)

[a] Biased estimate due to lack of recaptures in smaller size classes.

TBLS

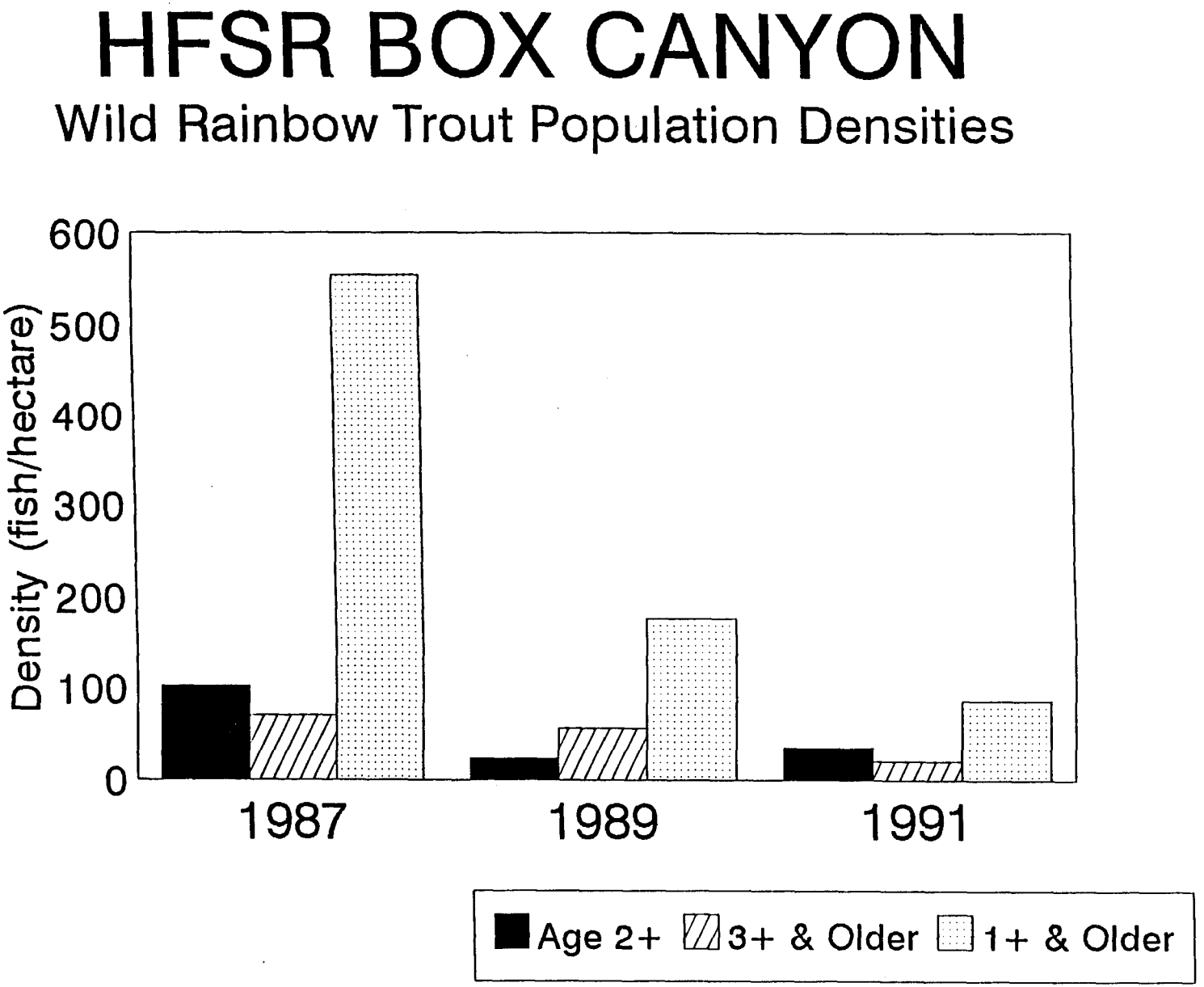


Figure 10. Estimated densities of wild rainbow trout for Box Canyon section of Henrys Fork, 1987, 1989, and 1991.

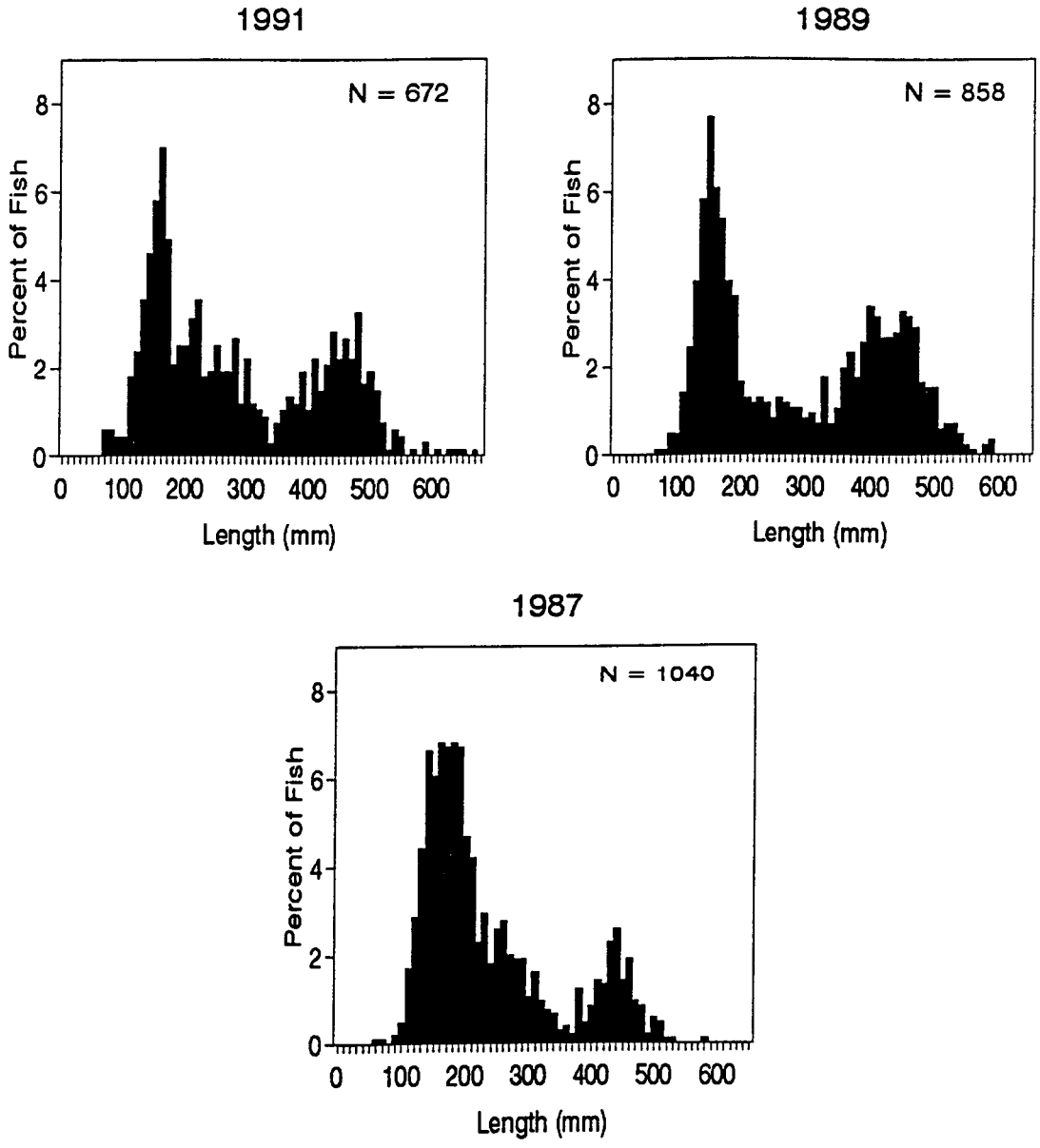


Figure 11. Length-frequency distributions of wild rainbow trout collected in Box Canyon section of Henrys Fork, 1987, 1989 and 1991.

February 1989, Island Park Dam release was 2.2 cms (85 cfs) when an arctic front dropped temperatures to -50°C (-607). The limited flows underwent severe surface and anchor icing, especially along the shoreline. Research has indicated age 0+ trout are strongly associated with shoreline habitat during winter periods (Angradi and Contour 1989). We believe age 0+ fish (1988 year class) were severely impacted in February 1989. The 1988 year class was depressed in the 1989 population estimate and is very weak (age 3+ fish) in the 1991 estimate. It is encouraging the 1991 estimate indicates more age 2+ rainbows are present in the population, although they do not approach the 1987 densities.

We did sample a few more large (600 mm or longer) fish in 1991 versus 1989 or 1987. Catch-and-release regulations went into effect in 1988 for this section and appear to be saving large fish from sport harvest.

Pinehaven

Estimated densities of wild rainbow (greater than 150 mm) for the Pinehaven section were similar in 1991 compared to 1987 (Table 4 and Figure 12). The Pinehaven estimates are not very reliable. In 1987 based on the lack of marked fish in individual size groups, we could not estimate age 2+ or age 3+ and older fish individually. In 1991 we could not make a separate estimate for age 3+ and older.

The length-frequency distribution still indicates low numbers of rainbow trout greater than 300 mm (Figure 13), unlike Box Canyon or Ora sections of the Henrys Fork. Despite catch-and-release regulations implemented in 1988, the rainbow population in the Pinehaven section has not shown an increase in large trout.

Ora Bridge to Seeleys

Estimated densities of all size classes had declined in 1991 compared with 1988 (Table 4 and Figure 14). Length-frequency distributions were not drastically different in 1991 compared to 1988, except for fish in the 280 to 350 size range, where fewer fish were captured in 1991 (Figure 15). Prolonged lower winter flows related to drought conditions may be impacting overwinter survival of age 0+ trout and, therefore, contributing to lower numbers of juvenile trout observed in 1991. The river flow during March below Ashton Dam was reduced to 3.8 cms (150 cfs) for several hours due to Ashton hydroelectric project spillway reconstruction. Inspections made by Joe Curry, Ashton Conservation Officer, indicated stranded and dead fish during the flow reduction on March 8, 1991. No actual mortality counts could be made prior to flow increases. However, it is likely smaller trout associated with shallower water were more heavily impacted. The density estimates show a much greater reduction in age 2+ trout compared to age 3+ and older during 1991 versus 1988.

R6DJ92

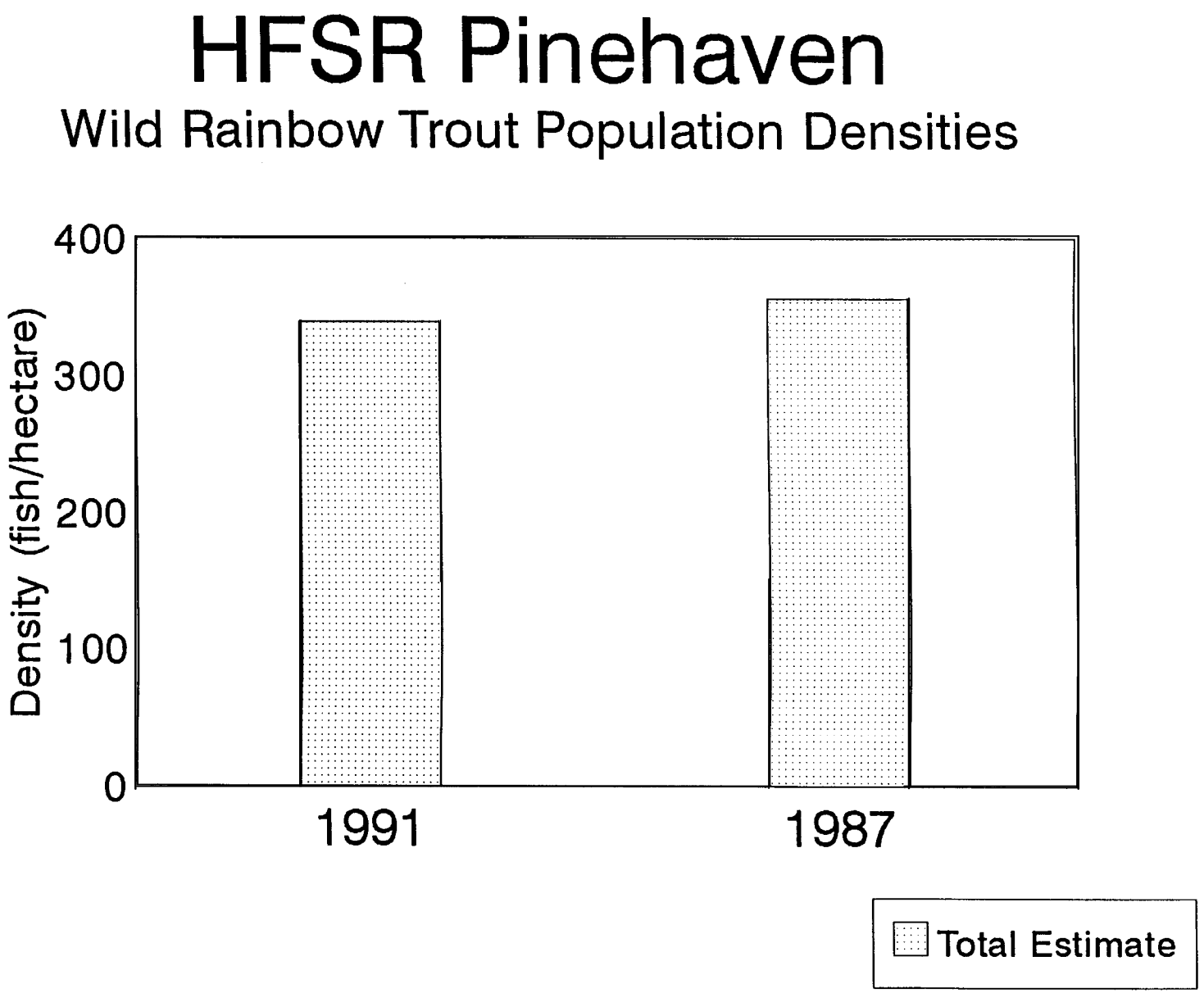


Figure 12. Estimated densities of wild rainbow trout for Pinehaven section of Henrys Fork, 1987 and 1991.

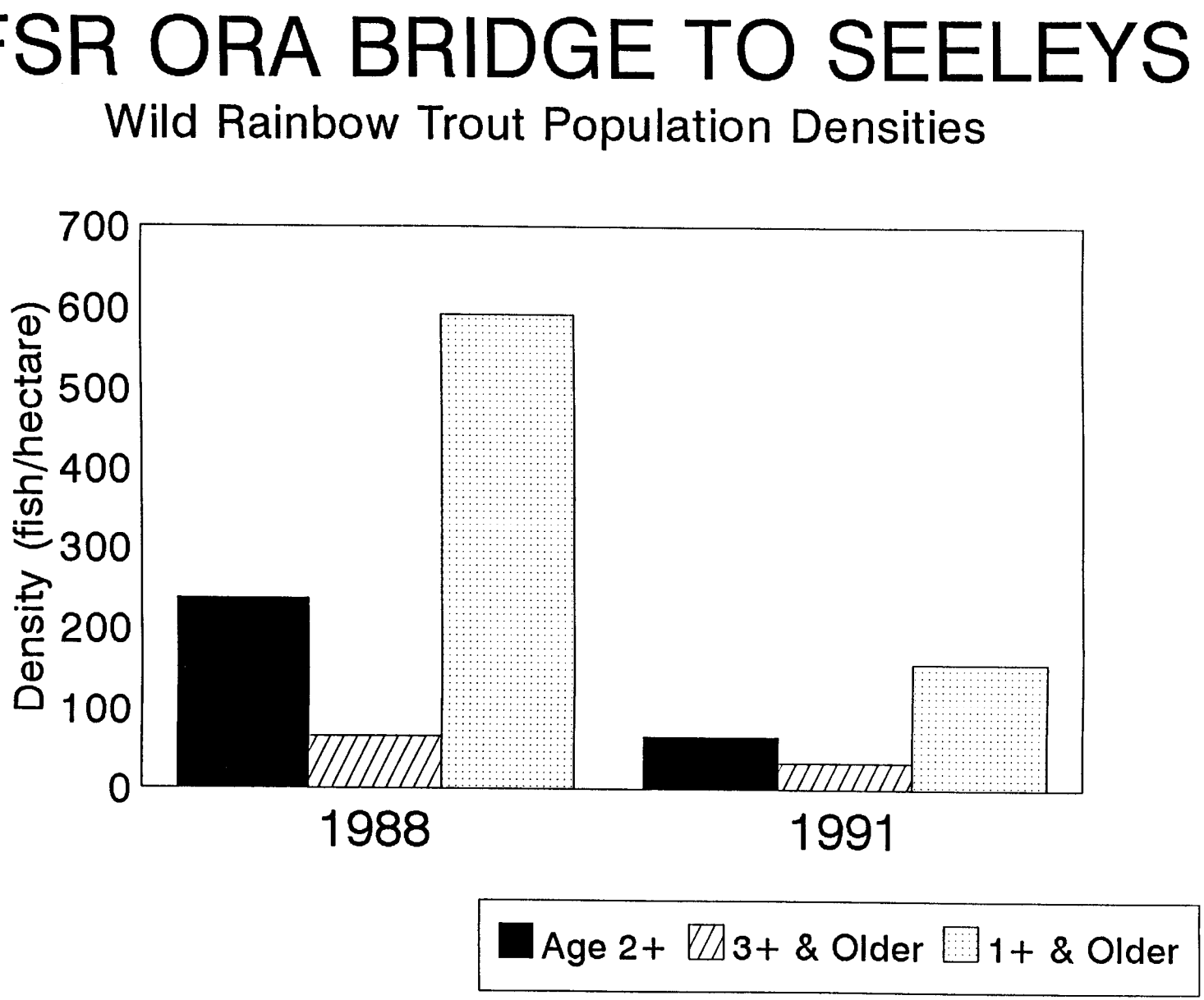


Figure 13. Length-frequency distributions of wild rainbow trout collected in Pinehaven section of Henrys Fork, 1987 and 1991.

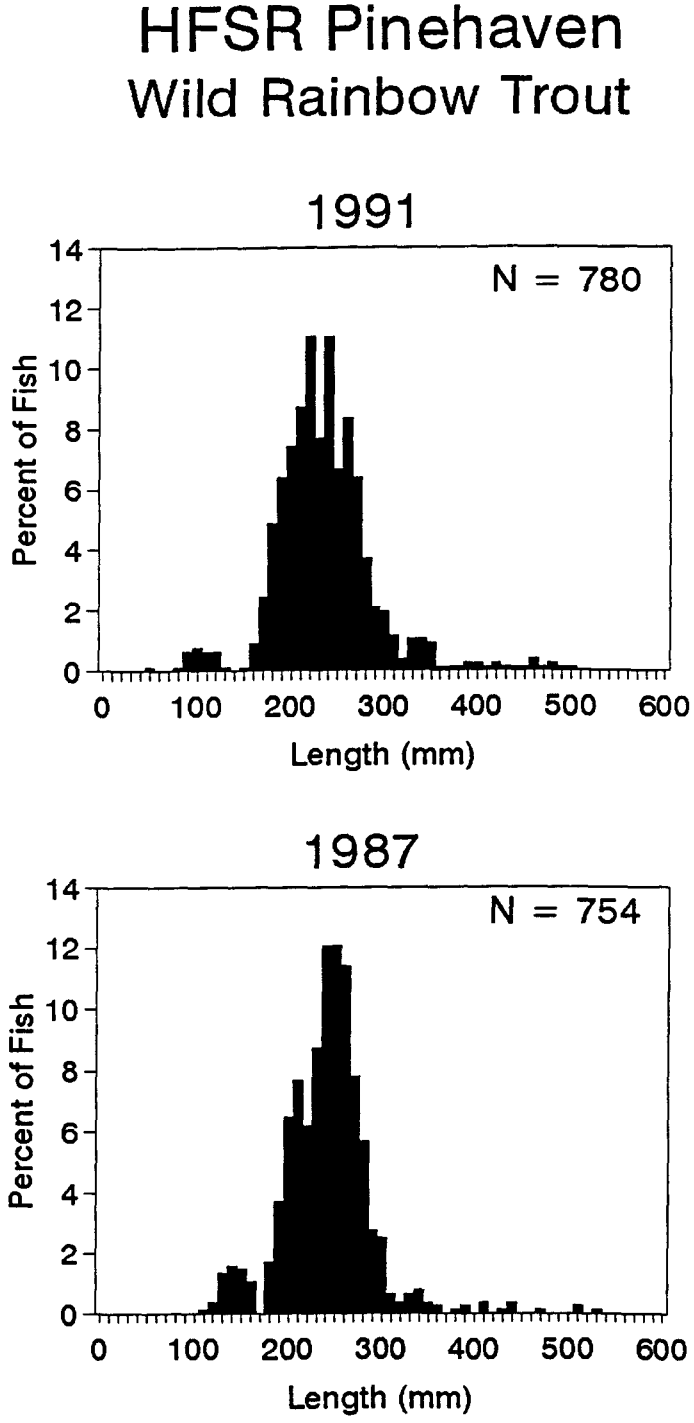


Figure 14. Estimated densities of wild rainbow trout for Ora Bridge to Seeleys section of Henrys Fork, 1988 and 1991.

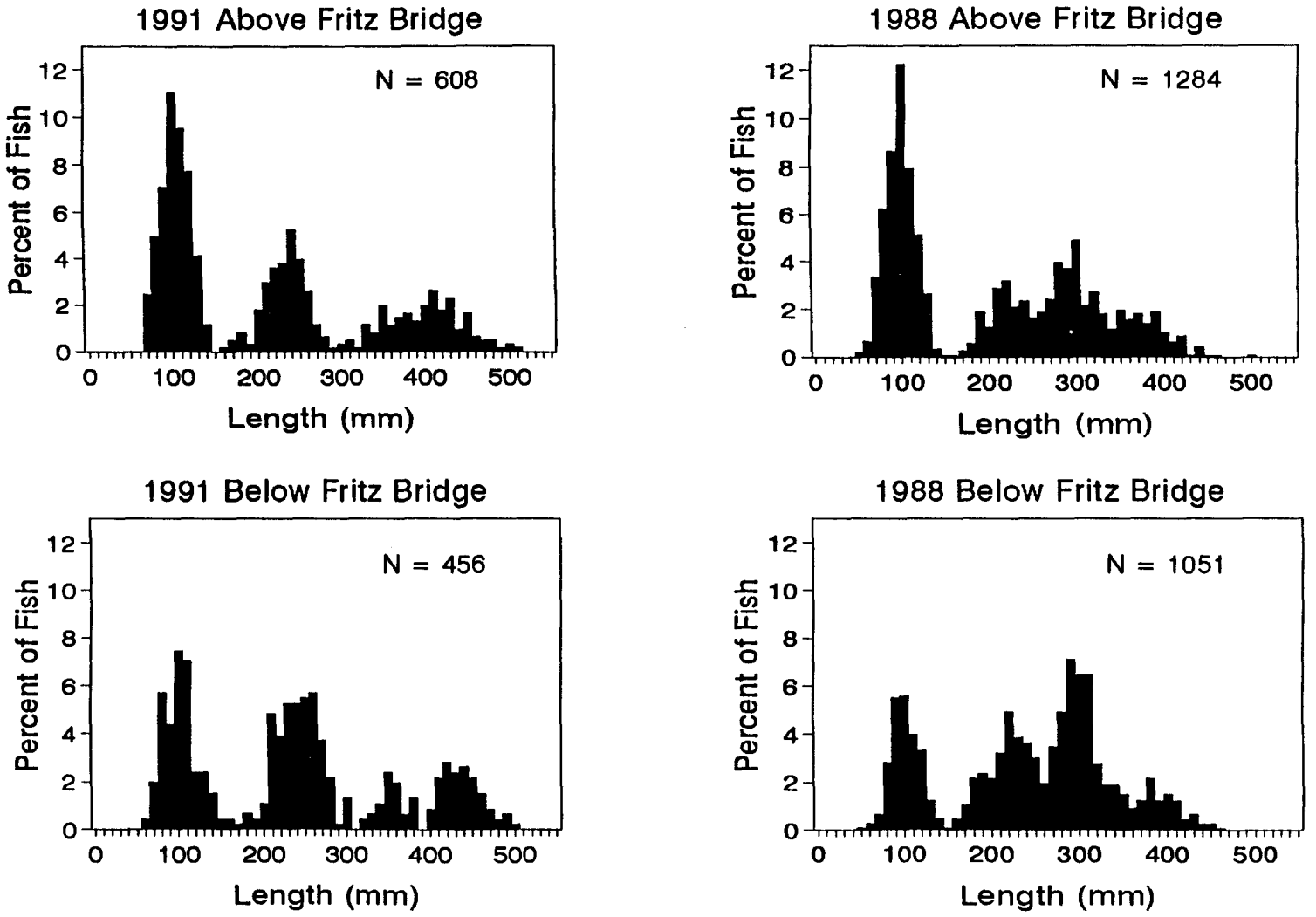


Figure 15. Length-frequency distributions of wild rainbow trout collected in Ora Bridge to Seeleys section of Henrys Fork, 1988 and 1991.

The Ora Bridge to Seeleys sample section is part of a larger area upstream from St. Anthony, which had the harvest regulations changed from six trout any size to two trout none between 8-16 inches. This regulation became effective on January 1, 1992. We expect to see a reverse in the trend of trout densities in this section by 1993 and 1994.

The Ashton Dam hydropower license stipulates the project will be operated as run-of-the-river. No directed flow fluctuations without permission from IDFG are permitted. Due to the demonstrated lack of ability to manage flows during scheduled reductions in 1992, the Department will not grant future flow reductions.

Nine brown trout ranging in size from 125 to 473 mm were captured in 1991 sampling. Also, five wild cutthroat trout (range 229-270 mm) were collected. We caught no cutthroat trout in 1988.

Big Lost River

Population Sampling

Mackay Reach-The density of wild trout 150 mm in length in the Mackay reach was high at 579/hectare, but were 32% lower than our 1987 estimates (Table 5). Length frequency distribution of wild rainbow trout (Figure 16) suggest poor recruitment of age 2+ fish compared to the 1987 distribution.

Brook trout density in this reach was low (95/hectare) and had declined to only 35% of the density we found in 1987 (Table 5).

Brook trout length-frequency distributions were similar for 1991 and 1987 (Figure 17).

We collected 42 hatchery rainbow trout ranging in length from 240 to 349 mm. Hatchery rainbow comprised 5% of our total sample.

Leslie Reach-Wild trout densities near Leslie were considerably lower than those found near Mackay (Table 5). Age 1+ fish comprised 88% of the sample, and less than 1% of the sample exceeded 500 mm (Table 6). Brook trout were the predominant species in this reach. Age 0+ brook trout were numerous. No brook trout larger than 300 mm were sampled (Figure 18). Only two hatchery rainbow trout were sampled (304 and 306 mm), comprising less than 1% of the sample.

Whitefish comprised 12% and 20% of the Mackay and Leslie samples, respectively. In the Mackay area, we found only five whitefish <140 mm, contrasting with 60 age 0+ whitefish in the Leslie reach. Age 1+ and 2+ whitefish were noticeably absent from our samples at each river reach (Figure 19).

R6DJ92

Table 5. Wild rainbow and brook trout population estimates and densities (fish/hectare) for the Big Lost River in the Mackay and Leslie sample section during 1987 and 1991.

Section	Year	Age class	Population estimates (densities) Wild rainbow	Brook trout
Mackay Reach	1987	1+	897 (300/ha)	651 (218/ha)
		2+	1,369 (458/ha)	NA
		>3+	340 (114/ha)	NA
		>1+	2,525 (844/ha)	808 (270/ha)
	1991	1+	1,347 (451/ha)	267 (89/ha)
		2+	187 (63/ha)	NA
		>3+	521 (174/ha)	NA
		>1+	1,730 (579/ha)	284 (95/ha)
Leslie Reach	1991	1+	302 (50/ha)	373 (62/ha)
		2+	35[a] (9/ha)	NA
		>3+	NA	NA
		>1+	344 (57/ha)	373 (62/ha)

[a] Biased estimate due to low number of recaptures.

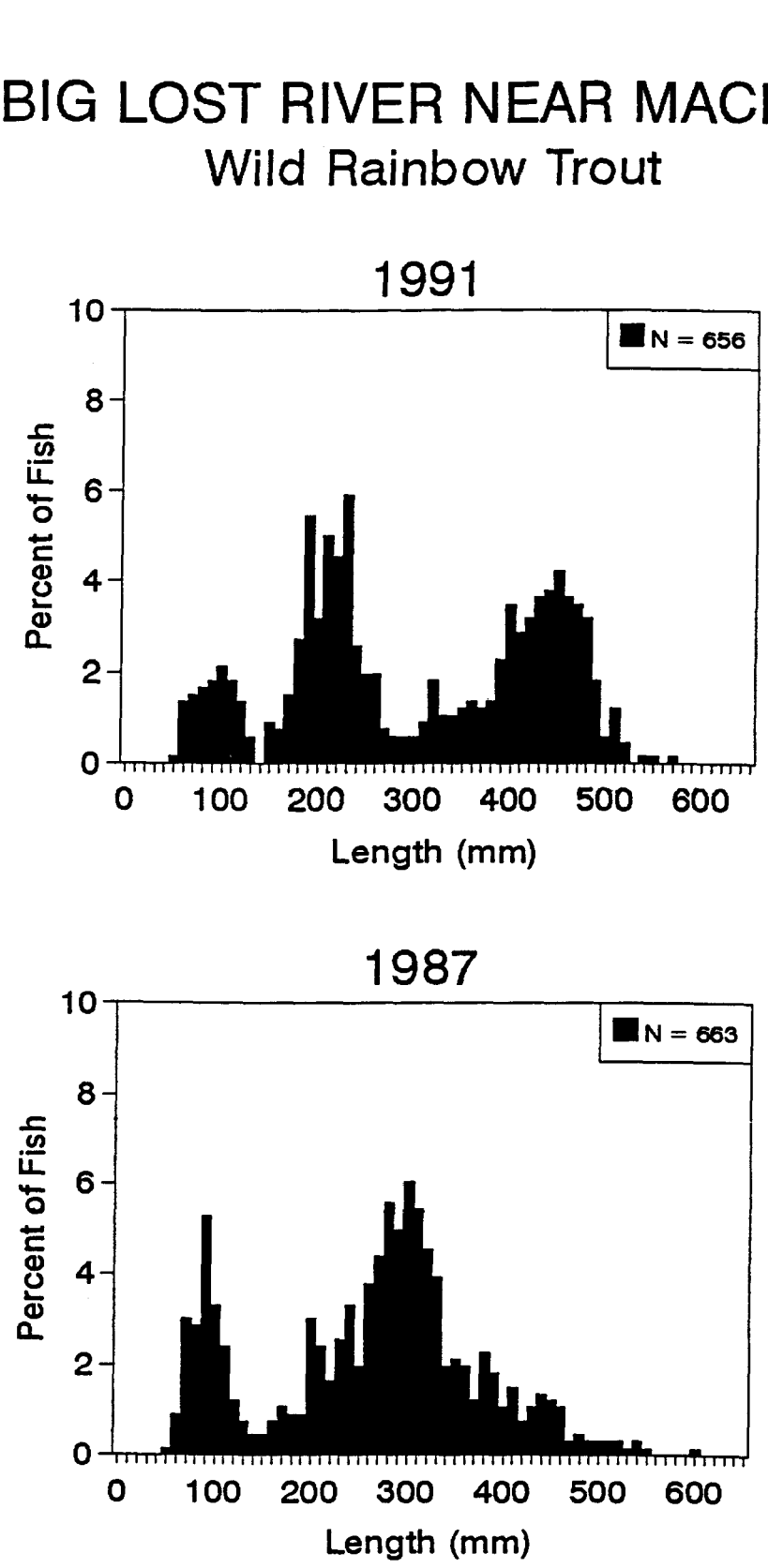


Figure 16. Length-frequency distributions for wild rainbow trout in the Big Lost River near Mackay, 1987 and 1991.

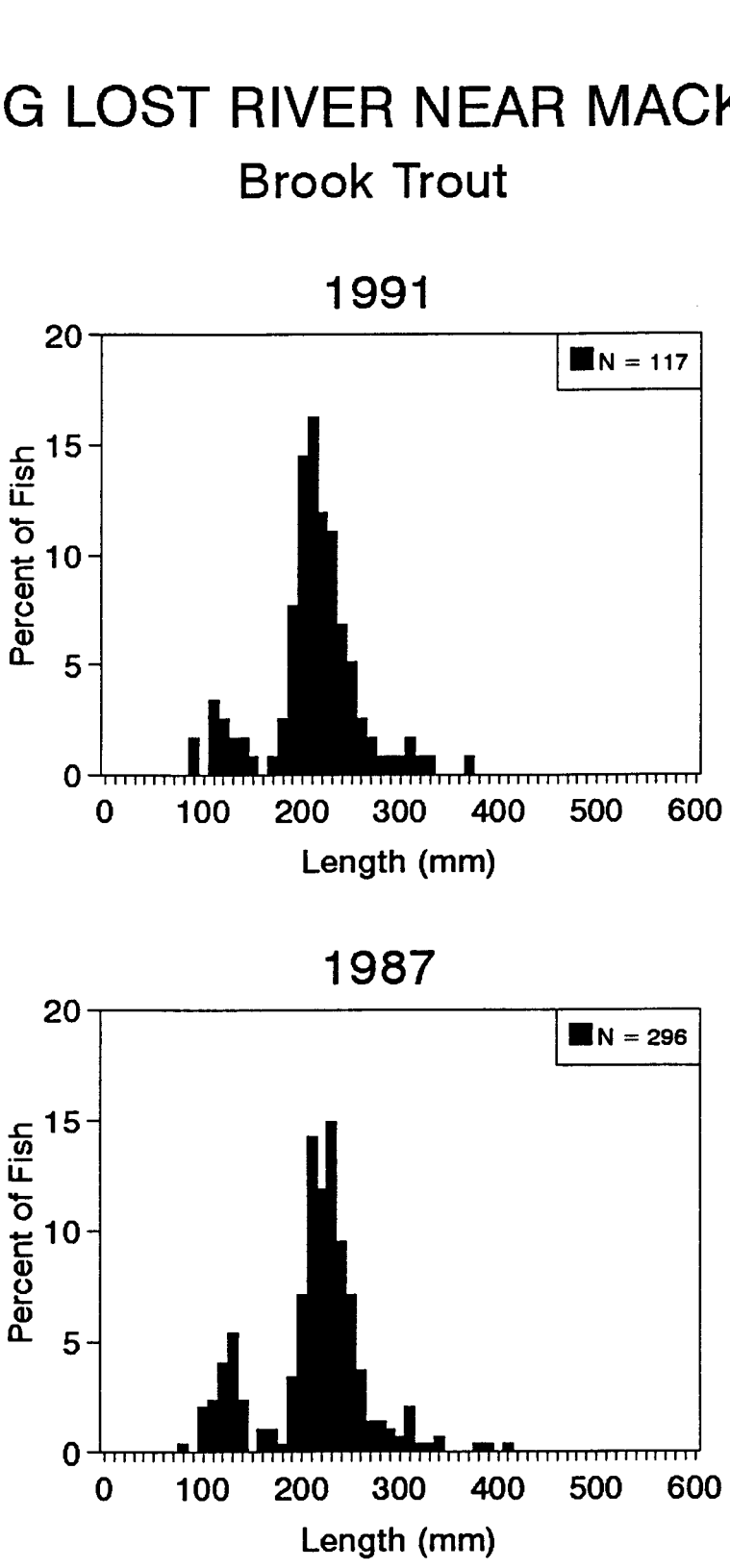


Figure 17. Length-frequency distribution for brook trout in the Big Lost River near Mackay, 1987 and 1991.

Table 6. Abundance of wild rainbow trout sampled in Mackay and Leslie reaches of Big Lost River, 1991 and 1987.

	1991		1987
Length (mm)	Mackay	Leslie	Mackay
>300	318 (55%)	13 (10%)	278 (53%)
>400	230 (40%)	9 (7%)	71 (13%)
>500	18 (3%)	1 (<1%)	11 (2%)

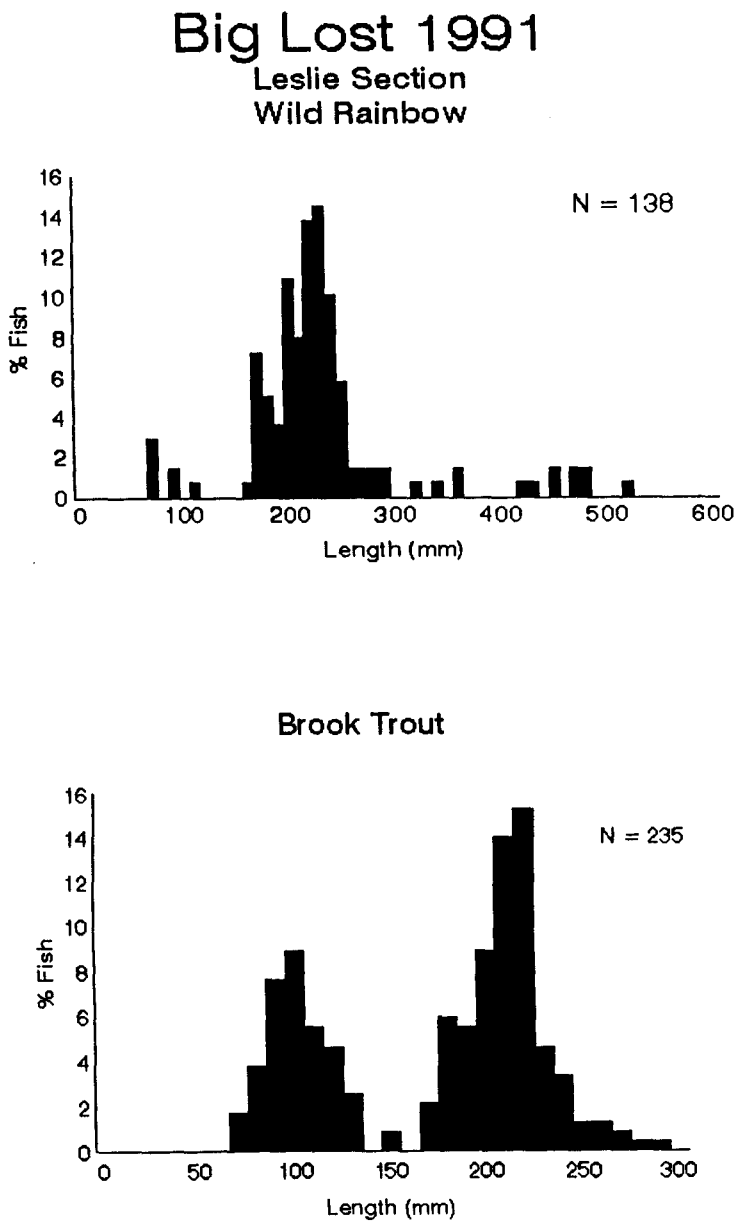


Figure 18. Length-frequency distributions for wild rainbow and brook trout in Big Lost River near Leslie, 1991.

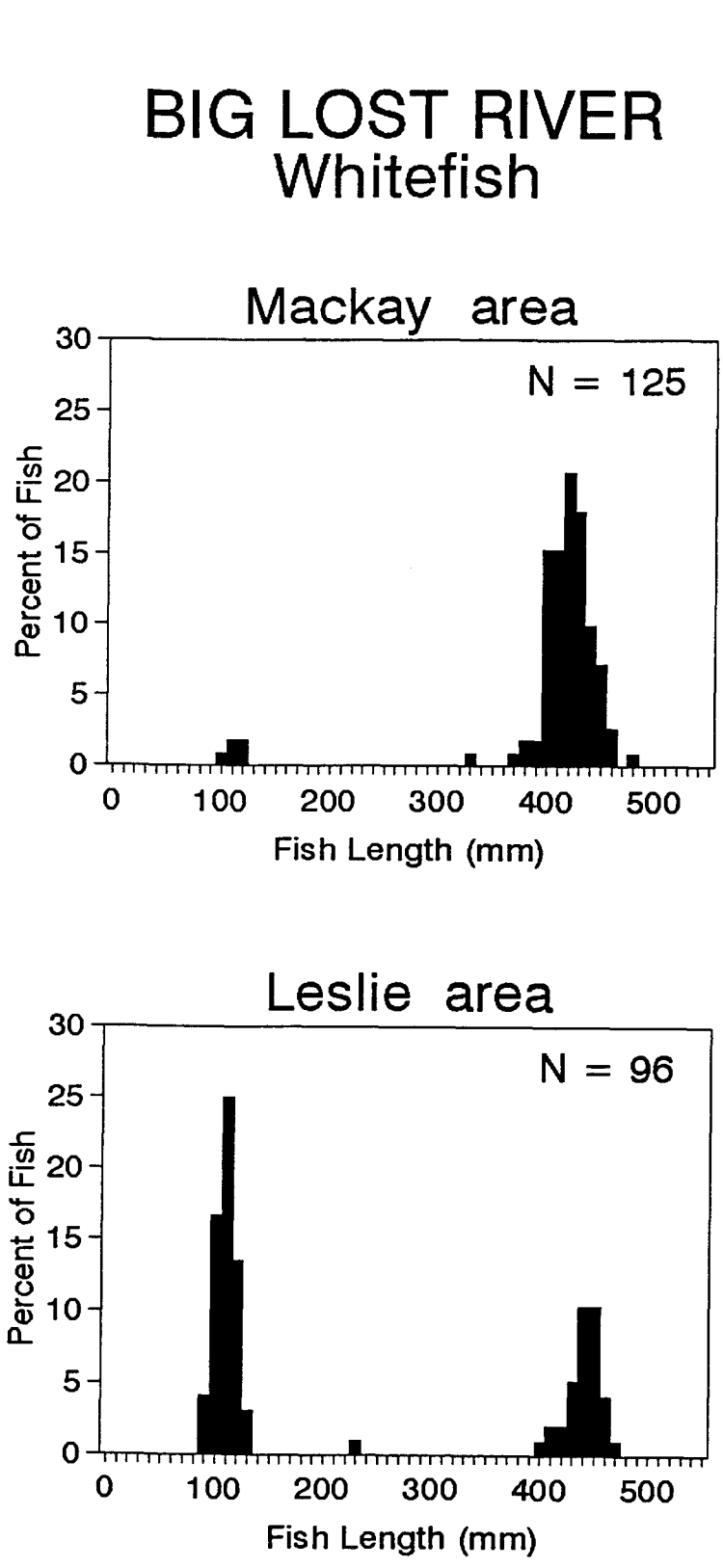


Figure 19. Length-frequency distribution for mountain whitefish captured in Big Lost River during August 1991.

The Big Lost River continues to produce a quality fishery with a good density of wild rainbow trout, particularly in the first three miles below the Mackay Reservoir, even though trout density was down by 33% from our 1987 estimate for the same river reach. The abundance of older trout in the population in 1991, despite the decrease in young fish numbers, suggests that light angling mortality, noted in our 1987 survey of this reach of the river, has continued.

Proportionately larger numbers of young trout and whitefish in the Leslie reach indicate that this area provides spawning and nursery habitat. It is also more strongly impacted by water withdrawals from the river and drought conditions in general than the upstream Mackay reach.

Given the evidence that exploitation of older trout continues to be low, we believe that the best explanation for the reduced numbers of trout in the Mackay and Leslie reaches is the prolonged drought and severe winter conditions for the past five years in the Big Lost River drainage.

Antelope Creek-We attempted to conduct population estimates in six transects on Antelope Creek. We were successful in only two of the six transects due to low trout numbers.

Antelope Creek supported few wild trout in 1991, the majority of which were brook trout (Table 7). The density of brook in transect number two was 6 fish/100 m2, a decline from 13 brook trout/100 m2 in 1987 (Table 8). Brook trout ranged in size from 99 - 168 mm in 1991 and 60 - 257 mm in 1987. Brook trout were the dominant species sampled in all sections except Cherry Creek section 1 (Table 7). Wild rainbow trout comprised the remainder of the wild trout population in Antelope Creek.

Cherry Creek-Cherry Creek, a tributary to Antelope Creek, had overall density estimates of 2.8 brook trout/100 m2 and 10 wild rainbow trout/100 m2, respectively, in the upper transect immediately above the forest boundary (Table 8). We did not capture enough fish in the lower transect to generate a population estimate. Wild rainbow trout comprised 76% of our sample in the upper transect. We found only brook trout in the lower transect below Ras Canyon. Habitat appeared to be good to excellent in both transects.

The Antelope Creek drainage has historically supported a productive wild trout fishery. The very low density of wild trout in the Antelope Creek drainage, together with reports from the local conservation officer and area residents that angler visitation to the drainage has steadily declined in recent years, also strongly suggests natural drought effects regulating this fishery. Critically low late summer and winter flows, coupled with periods of extremely cold temperatures without insulating snow cover, may have resulted in severe icing and subsequent dewatering of stream channel reaches. Such conditions have been shown to cause heavy overwinter mortality in other western streams. Habitat

Table 7. Population sampling for Antelope, Cherry, and Alder creeks during July 1991.

Stream	Section	Length (m)	Width (m)	Number sampled			Mean size (range) mm	
				BRKa	WRB	HRB	BRK	WRB
Antelope Creek	1	130	4.0	8	3	--	131(95-166)	134(58-183)
	2	109	5.9	7	2	29	131(99-168)	119(113-124)
	3	461	7.5	21	--	5	174(110-270)	
	4	481	6.7	5	6	0	240(205-286)	246(152-296)
	5	--	--	--	--	--	--	270
	6	376	5.7	--	3	--	--	274(233-320)
Cherry Creek	1	121	2.7	8	27		83(54-157)	140(52-251)
	2	155	3.9	13	--	--	157(62-258)	--
Alder Creek	1	98	2.8	10	--	--	125(55-175)	--
	2	115	3.3	29	2	--	131(54-175)	2(163-198)

a BRK = brook trout
WRB = wild rainbow trout
HRB = hatchery rainbow trout

TBLS

Table 8. Population estimates for Antelope, Cherry, and Alder creeks during 1987 and 1991. Sampling on four sections of Antelope, one section of Cherry, and one section of Alder creeks provided too few fish to complete population estimates.

Stream	Section	Year	Population estimate			Density (fish/100 m)	
			BRK[a]	WRB	HRB	BRK	WRB
Antelope Creek	2	1987	41	NA	NA	13	NA
		1991	16[b]	NA	40	6	NA
Antelope Creek	3	1991	NA	21	NA	NA	0.6
Cherry Creek	1	1991	9	33	--	2.8	10.1
Alder Creek	2	1991	36	NA	--	9.5	NA

a BRK = brook trout; WRB = wild rainbow trout; HRB = hatchery rainbow trout.

b Estimate biased due to poor reduction in catch from run 1 to run 2.

in the Antelope and Cherry Creek sections was in good condition with stable banks, good woody vegetation, and deeper pools present to provide overall good trout rearing areas.

Alder Creek-We attempted population estimates in two transects on Alder Creek but were able to capture enough fish only on the lower transect. We calculated a density of 9.5 wild trout/100 m2. The mean size of trout in Alder Creek section 2 was 132 mm (Table 7). Brook trout comprised 93% of trout captured in section 2 and 95% of all trout caught in both sections of Alder Creek.

We believe that Alder Creek and other small Big Lost River tributaries are affected by the same general environmental conditions as the main river and Antelope Creek. Until normal annual conditions resume and baseline stream flows return to average levels, we can expect a continuation of depressed fish population conditions observed in 1991.

Evaluations of Hatchery Trout Releases

Angler returns of reward jaw tags indicated an overall 22% return-to-the-creel of hatchery put-and-take rainbow stocked in the Mackay reach in 1991. Return rates were highest from the May 30 release, but varied through the summer (Table 9).

Overall return rates for tagged rainbow trout releases in 1991 in Antelope and Iron Bog creeks were 20% and 22%, respectively. Later releases had higher return rates versus early released trout.

Only four tags were returned during the 1992 fishing season. These were all from the Big Lost River. The lack of recruitment of hatchery tagged fish into the fishery after the first summer is consistent with other Region 6 rivers and streams. Our data do not indicate good overwinter survival for hatchery fish in stream environments.

The return rates of hatchery tagged rainbow trout in the lower Big Lost River and Antelope and Iron Bog creeks are marginal based on management goals. However, electrofishing data and angler reports indicate almost no fishery would have existed in 1991 without hatchery fish, especially in Iron Bog and Antelope creeks.

R6DJ92

Table 9. Tag return data (percentage) for hatchery put-and-take rainbow trout released in Big Lost River, Antelope Creek and Iron Bog Creek during 1991. For tag returns through July 1992. Data derived from voluntary angler returns.

Location	Date Released	Return Rate (percentage) 1991	1992	Total
Big Lost River	05-30-91	26	2	28
	06-14-92	12	0	12
	07-02-91	24	0	24
	07-16-91	16	4	20
Antelope Creek	05-30-91	14	0	14
	07-09-91	14	0	14
	07-23-91	32	0	32
Iron Bog Creek	05-30-91	16	0	16
	07-09-91	28	0	28

RECOMMENDATIONS

1. Provide population data to South Fork instream flow assessment study. The combined data indicates significantly higher survival of age 0 and age 1 trout with flows of 1,200 cfs or more. Provide technical input to Program Coordination in negotiations with Bureau of Reclamation over minimum winter flow releases below Palisades Dam.

2. Continue to monitor South Fork and Henrys Fork populations to maintain data base for management decisions.

3. Continue to work with Bureau of Reclamation for winter minimum flows of 200 cfs for Henrys Fork below Island Park Dam. Optimum flows would be 300 cfs or more. Sustainable outflows are preferred over major fluctuations over the winter storage period.

4. Monitor Big Lost River to insure 50 cfs legally mandated winter flow releases are maintained below Mackay Reservoir.

5. Continue to stock Big Lost River, Antelope Creek, and Iron Bog Creek. While return rates are marginal, wild populations in the Antelope Creek drainage will not provide for recreational opportunity.

R6DJ92

LITERATURE CITED

Angradi, T. and C. Contor. 1989. Henrys Fork Fisheries Investigations. Federal Aid in Fish Restoration Job Completion Report. Project No. F-71-R-2, Subproject III, Jobs 7A and 7b. Idaho Departmentof Fish and Game, Boise.

Lackey, R.T. and W.A. Hubert. 1977. Analysis of Exploited Fish Populations. Sea Grant, Extension Division. Virginia Polytechnic Institute and State University, Blacksburg, Virginia 24061. VPI-SC-76-04. 97 p.

Elle, S., C. Corsi, and D. Aslett. 1987. Regional Fisheries Management Investigations. Federal Aid in Fish Restoration. Job Performance Report. Project F-71-R-11, Idaho Department of Fish and Game, Boise.

Seber, G.A.F. and D. D. LeCreu. 1967. Estimating Parameters From Catches Large Relative to the Population. Journal of Animal Ecology. 36:631-643p.

R6DJ92

JOB PERFORMANCE REPORT

State of: Idaho

Name: Regional Fishery Management Investigations

Project No: F-71-R-16

Title: Region 6 Technical Guidance

Job No: 6-d

Period Covered: July 1, 1991 to June 30, 1992

ABSTRACT

Technical assistance was provided to federal, state, and local agencies upon request. Technical assistance was also provided to sportsmens' clubs on habitat improvement projects and to private individuals regarding private fish ponds.

Authors:

Steve Elie
Regional Fishery Manager

Mark Gamblin
Regional Fishery Biologist

R6DJ92

OBJECTIVES

1. To assist the Department of Water Resources, the Federal Energy Regulatory Commission, and the U.S. Army Corps of Engineers in evaluating the effects and minimizing the impacts of habitat alterations and diversion of natural flows on fish populations.

2. To provide information to private and government agencies on fisheries and aquatic habitat to assist with habitat restoration efforts.

3. To assist public with fish pond inquiries.

4. To investigate all fish kills with directives to prevent future kills and to provide data for criminal prosecution where necessary.

5. To evaluate land management activities by U.S. Forest Service, Bureau of Land Management, and Idaho Department of Lands. Provide comments to optimize fish and wildlife habitat.

METHODS

We responded to requests for data, project reviews and recommendations for individuals, government agencies and sportsman clubs as time permitted. Meetings were attended and field inspections conducted as necessary to formulate verbal and written responses on a project-specific basis.

FINDINGS

During 1991, we expended the following number of days responding to requests for technical assistance on water-related issues as follows:

Army Corps of Engineers	3	
Bureau of Land Management	7	
Bureau of Reclamation	8	
U.S. Fish and Wildlife Service	4	
U.S. Forest Service	12	
U.S. Soil Conservation Service	1	
Federal Energy Regulatory Commission	18	(8 projects)
Environmental Protection Agency	1	
Idaho Department of Health and Welfare Division of Environmental Quality	11	(Henrys Lake)
Idaho Department of Lands	3	

R6DJ92

Idaho Department of Transportation	1
Idaho Department of Water Resources	17
Idaho Water Resources Board	11
Idaho Outfitters and Guides Board	3
Madison County	2
Bonneville County	2
City of Rexburg	2
Private Fish Ponds	6(5 projects)
Sportsman Clubs	10
Private Development	5

Natural stream bed loss in Birch Creek remained a major issue with the Birch Creek Hydropower Project during 1991. A proposal to place a geotextile liner under 1.6 miles of the streambed above the power plant diversion was approved by various agencies. Water bed loss in this reach was 6 to 10 cfs. Fish salvage and subsequent dewatering occurred prior to construction during the week of October 16. Following placement of the liner and rewatering of the channel, the bed loss was measured at 20 cfs. The developer was allowed further bank treatment to reduce water loss in areas where fish habitat drop structures were placed for mitigation. The additional treatment only slightly reduced bed loss. During winter, ice scouring exposed and lacerated the liner in multiple locations, contributing to additional bed loss. The developer then proposed major bentonite applications in running water which were refused. This total process occupied six to seven days and will require attention in 1992 because the liner leakage is an ongoing problem.

Fall River Hydroelectric Project began construction. We reviewed construction impacts and worked with Corps of Engineers on minimizing impacts to wetlands. The minimum flow deficiencies required an amendment request to FERC. The final amendment was still unsatisfactory below Farmer's Own Canal diversion where the volume and accounting of instream flows are inadequate.

Ashton Hydro Project was required to redesign the dam crest to pass the probable maximum flood (PMF). During planning, the project dewatered the Henrys Fork for four miles downstream resulting in a major unquantified fish kill. Future approval for downstream flow reductions to accommodate Ashton-St. Anthony work activities will not be granted by Idaho Department of Fish and Game. Eight days additional time was spent on construction review and comment, monitoring of construction and post construction erosion control, and cofferdam removal. This project was mandated by FERC, created a significant short term impact on the fisheries resources, and was uncalled for except to meet PMF conditions which are unrealistic.

The Yellowstone Hydroelectric Project on Falls River proceeded with preliminary license investigations. We reviewed and commented on instream flow studies and wildlife impacts. Mark Gamblin assisted with fisheries inventory via

snorkeling. We pushed the developer for public meetings prior to licensing, which were held in June and July in Ashton and Idaho Falls, respectively.

We responded to the fish kill, referenced above, associated with Ashton Hydro Project. A Department representative observed stranded and dying wild trout, but flows were reinstated prior to any evaluation of fish losses. Remodeling of the Ashton project turbines will enable the project to provide bypass flows at all times in the future.

In 1991, we cooperated with sportsmens' groups, agencies, and landowners on five habitat restoration projects. Through the Department Challenge Grant project, we constructed two fish screens on Howard Creek, Henrys Lake tributary. Henrys Lake Foundation cooperatively funded the screen project. The Foundation and Department personnel placed tree revetments in 1/3-mile of Targhee Creek to reduce headcut erosion. We also constructed 1.5 miles of riparian fencing on Cellars Creek, Willow Creek drainage to restore past grazing damages. A cooperative willow planting activity with Idaho Falls Trout Unlimited was completed to enhance woody species recovery.

The Department reviewed and provided comments for the U.S. Forest Service streambank stabilization in Rainey Creek and fish habitat construction in Buffalo River.

For the second year, we cooperatively sponsored a whitefish and litter contest to enhance angler awareness. Idaho Falls Trout Unlimited and Upper Valley Fly Fisherman Federation cooperated. A fishing and litter pick up contest was combined with fish preparation and cooking demonstration.

We provided habitat improvement recommendations to landowners on Cherry Creek (Big Lost River), Warm Creek (Big Lost River), Sawmill Creek (Little Lost River), Cellars Creek (Willow Creek) and Conant Creek (Fall River).

Planning and funding continued for Palisades Creek fish screens at Palisades Dam turbine upgrade mitigation by Bureau of Reclamation. Land surveys, purchase of land and development of blueprints were completed. Our Department met at Palisades Creek for screen sitting and provided design and operation input.

Major fish kills occurred on the Henrys Fork (described above) and Henrys Lake. The Henrys Lake fish kill resulted from low winter dissolved oxygen levels. We responded with aeration equipment in localized areas around the lake which had electric service and where fish were concentrated. A total of 9,000 trout were removed from the lake. An additional 5,000 to 10,000 trout were not recovered. No final estimate of fish loss was possible.

R6DJ92

RECOMMENDATIONS

The Technical Assistance workload continued to occupy a large portion of the Region 6 Fish Management workload. Effective November 1991, an environmental planner was hired for Region 6. This new position is planned to handle hydro project, stream alteration, and water quality concerns following initial review and input from the management staff and should significantly reduce the habitat time demands. The recommended exchange of duties is for January 1, 1992.

A nutrient loading study was begun at Henrys Lake in response to winter kill conditions in March to May 1991. The results from this study should be used to recommend management directions at Henrys Lake regarding agricultural runoff and summer home sewage treatment. Idaho Department of Fish and Game will investigate a commercial aeration system for 1992 installation.

R6DJ92

Submitted by:

Mark Gamblin
Regional Fishery Biologist

Steve Elle
Regional Fishery Manager

Jim Tharp
Fishery Technician

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

Steven M. Huffaker, Chief
Bureau of Fisheries

Al Van Vooren
Resident Fisheries Manager